



Final
Environmental Assessment
Facility Renovation / New Construction and Operation of
Marine Corps Units (MAG-42, HMLA-773 and MALS-42)
Relocated from
Naval Air Station Atlanta
to
Robins Air Force Base

78th Civil Engineer Group, Environmental Management Division
Robins Air Force Base, Georgia

August 16, 2007

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**FINDING OF NO PRACTICABLE ALTERNATIVE /
FINDING OF NO SIGNIFICANT IMPACT
FACILITY RENOVATION / NEW CONSTRUCTION AND OPERATIONS OF
MARINE CORPS UNITS (MAG-42, HMLA-773 AND MALS-42)
RELOCATED FROM NAVAL AIR STATION ATLANTA TO ROBINS AIR FORCE
BASE**

Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense Directive 6050.1 and Air Force Regulation 32 CFR Part 989, the 78th Civil Engineer Group, Environmental Management Division has prepared an Environmental Assessment (EA) to identify and assess potential effects of renovating existing facilities and new construction to support the relocation of various Marine Aircraft Groups from Naval Air Station (NAS) Atlanta to various facilities at Robins Air Force Base (AFB). This EA is incorporated by reference into this finding.

PURPOSE AND NEED

Marine Corps units must be relocated from NAS Atlanta as a prerequisite of NAS Atlanta closure to streamline operations and reduce costs associated with national defense. Base Realignment and Closure (BRAC) 2005 directed relocation of Marine Aircraft Group (MAG)-42, Marine Light Attack Helicopter Squadron (HMLA)-773 and Marine Aviation Logistics Squadron (MALS)-42 from NAS Atlanta to Robins AFB by the end of 2010. (EA Sections 2.1, 2.2, 2.3, pages 3 to 5)

DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action consists of renovating and demolishing existing buildings; constructing a new helicopter maintenance hangar and parking areas; and the realignment of Beale Drive due to force protection/anti-terrorism requirements associated with the new hangar. The above-specified Marine Corps units would then relocate to and operate at Robins AFB. They would occupy, in part, facilities currently occupied by 19th Air Refueling Group (ARG), which will be vacating Robins AFB in 2008 under a separate action. (EA Section 2.3, pages 5 to 19)

DESCRIPTION OF THE NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction or renovation would occur and designated Marine Corps units would not relocate from NAS Atlanta to Robins AFB or operate at Robins AFB. (EA Section 2.4, page 19)

ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

Alternative sites for Marine Corps operations facilities at Robins AFB were also initially considered. The alternatives were compared against the Marine Corps unit's requirements including a site of sufficient size where DoD minimum force protection construction standards could be implemented; where available facilities of similar size and function were in place; where Marine personnel and operations could be collocated in a manner that provided ready access to the airfield taxiway and allowed for the continued efficient performance of maintaining combat-ready aircraft and personnel; and where renovation/construction activities could be

performed within the NAS Atlanta closure timeframe (as required under BRAC recommendation). No other sites/areas at Robins AFB were identified that met all the requirements described in Section 2.2, and were not carried forward for consideration. (EA Section 2.5, pages 20-21)

ANTICIPATED ENVIRONMENTAL EFFECTS

Implementation of the Proposed Action would result in no or minimal impacts on the following resources and elements: topography, geology, soils, groundwater, water supply, and drinking water, wastewater, solid waste, hazardous materials and waste, and biology.

Implementation of the Proposed Action would also result in either insignificant impacts or beneficial impacts to the remaining resources and elements. During construction, contractors would use Best Management Practices (BMPs), obtain all appropriate permits (coverage under National Pollutant Discharge Elimination System General Permit GAR100001; Houston County Sediment and Erosion Control Permit; and Dig Permit from 78 CEG), and remove and dispose of waste appropriately under governing regulations, thus causing only temporary and insignificant impacts to surface water, storm water, air quality, and solid and toxic waste management. Nor would these elements be significantly affected by long-term operations. (EA Sections 4.1.2.2 [pages 54 to 55], 4.1.4 [pages 58 to 60], 4.2.2 [pages 65 to 67], 4.3.2 [pages 69 to 70], and 4.3.4 [pages 72 to 74])

Floodplains and Wetlands: The locations for Beale Drive realignment, a new parking area and new location for a relocated atmospheric sensor are within the 100-year floodplain. The selected location of the proposed new hangar requires realignment of Beale Drive and placement of the adjacent parking lot sufficiently distant from the hangar to meet Security Forces anti-terrorism/force protection requirements between buildings and roads. The sensor is currently located in the area proposed for the new parking area, and thus must be relocated to another nearby location. Non-floodplain alternatives that involved alternative siting within the area were evaluated and found impracticable; existing parking lots near the proposed hangar site are full and no other location for the new parking lot was identified within a reasonable distance from the proposed hangar; alternative hangar sites that were evaluated failed to meet various criteria for the project so none were evaluated in the EA; alternatives to siting the atmospheric sensor in the floodplain did not meet functional and siting requirements. (EA Section 2.5 [pages 20 to 21] and EA Section 4.1.3.2 [pages 55 to 58])

Fill would be placed to raise the elevation of the 1.2-acre Beale Road realignment, parking lot areas, and atmospheric sensor station above the base flood elevation. Approximately 5,000 cubic feet of surface water in the 3-mile wide Ocmulgee River floodplain would be displaced during a 100-year flood event. Placing fill in this area and using it as a parking area would result in no significant impact on the overall conveyance of the river, as the backwater area of the Ocmulgee River contains a significant floodwater storage capacity to sufficiently handle the displaced floodwaters. Based on the evaluation performed, the Proposed Action would have minimal to no effect on floodplains or floodplain characteristics. (EA Section 4.1.3.2, pages 55 to 58)

Air Quality: Construction, renovation and operations associated with the Proposed Action would not affect air resources to a significant degree. Emissions from construction activities would be of limited quantity and duration, and thus, would be insignificant. Marine Corps operations would be similar to those of the current occupants vacating the area prior to the Marine Corps

arrival (19 ARG). Mobile air emissions would be less than at present. The amount of PM, CO, NOx, and SOx emissions would be significantly less than current 19 ARG-associated air emissions. VOC emissions associated with flight operations would increase but not result in violations of National Ambient Air Quality Standards. (EA Section 4.2.2, pages 64 to 67)

Noise: The Proposed Action would not result in significant impacts on the noise environment. Noise generated during construction activities would be of limited volume and duration and thus, would be insignificant. There would be an incremental increase in total noise events at and in the vicinity of Robins AFB, as the Marine Corps helicopter operations would include more flights than ARG fixed-wing operations that are departing. However, this increase is very small (less than 5 percent) compared to the total number of Robins AFB flights on an annual basis. Helicopter noise has similar amplitude to fixed-wing aircraft, but helicopters generate a pulsating noise while the fixed-wing aircraft generate a continuous noise. Since the decibel noise levels are very similar significant impacts to the noise environment would not occur. The Marine Corps helicopter flight patterns at Robins AFB would be mainly oriented to the east of the runway. They will incorporate noise abatement procedures to limit noise impacts to insignificance, including measures to avoid low-altitude flying over noise sensitive areas. (EA Section 4.4.2, pages 74 to 78)

Cultural Resources: The Proposed Action includes minor renovation of Buildings 97, 106, and 2067, which are eligible for listing on the National Register of Historic Places (NRHP). The Proposed Action renovations would not impact the historic integrity of these buildings; furthermore, archaeological resources would not be affected by the Proposed Action. 78 CEG/CEV consulted with Georgia Department of Natural Resources, Historic Preservation Division (HPD)/State Historic Preservation Office (SHPO), and SHPO concurred that the Proposed Action would result in “no effect” and “no adverse effect” to archaeological resources and historic resources, respectively, listed on or eligible for listing on the NRHP. If the proposed renovation plans change, 78 CEG/CEV will further consult with SHPO as necessary. (EA Section 4.6.2, pages 79 to 81)

Socioeconomics: The Proposed Action would produce a positive effect on the socioeconomic environment. Renovations and construction expenditures would provide short-term stimulus to the region’s economy and the operations would provide long-term economic stimulus. The Proposed Action would not result in adverse health impacts to children or significant impacts to low-income and/or minority populations. (EA Section 4.7.2, pages 82 to 83)

Transportation and Safety: Marine Corps helicopter flight patterns would be conducted in accordance with Robins AFB flight operation procedures as needed to avoid conflicting with existing, fixed-wing aircraft traffic and adhering to all applicable safety regulations and guidelines would result in insignificant safety concerns. (EA Section 4.8, pages 83 to 85)

CUMULATIVE IMPACTS

The cumulative effects of the Proposed Action when added to other past, present, and reasonably foreseeable future actions were evaluated and found to be insignificant. Of future BRAC actions, only the relocation of the 202nd Engineering Installation Squadron (EIS) on the western side of the airfield (between Centurion Boulevard and Eagle Avenue) was identified as potentially producing cumulative environmental effects in the immediate vicinity of the Proposed Action area. The 202 EIS project would increase the area of impermeable land surface

and temporarily increase air emissions, noise, and volume of solid waste and toxic materials generated by construction/renovation activities. On a long-term basis, this project would increase the generation of solid waste and sanitary wastewater, and the consumption of potable water.

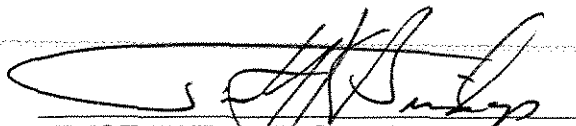
Actions (not related to BRAC) that were identified as potentially producing cumulative environmental effects in the immediate vicinity of the Proposed Action area include the construction of an Avionics Maintenance facility and a Maintenance Squadron facility for the 116 ACW; and the departure of the 19 ARG. The construction and demolition activities associated with these projects would increase the area of permeable land surface and temporarily increase air emissions, noise, and volume of solid waste and toxic materials generated by construction/demolition activities. Cumulative environmental effects resulting from the departure of the 19 ARG would be offset by the arrival of the Marine Corps units from NAS Atlanta. (EA Section 4.9, pages 85 to 88)

PUBLIC NOTICE

A notice was published on 13 June 2007 in the *Houston Home Journal* inviting the public to review and comment upon the Draft Final EA; no comments were received. A request was also submitted to the Georgia State Clearinghouse on 13 July 2007 requesting review by various state agencies and a review period of 30 days. Responses were received from the HPD, the Hazardous Waste Management Branch of the Georgia Environmental Protection Division, and the Georgia Department of Transportation, and are addressed in the Final EA; all agency consultation is complete.

FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA) - Taking the above information into consideration, pursuant to Executive Orders 11988, *Floodplain Management*, and the authority delegated by Secretary of the Air Force, Order 791.1, I find there is no practicable alternative to conducting the Proposed Action within the floodplain, and that the Proposed Action includes all practicable measures to minimize harm to the environment. This finding fulfills both the requirements of the referenced Executive Order and the Air Force Environmental Impact Analysis Process (32 C.F.R. Part 989.14) for a Finding of No Practicable Alternative.

FINDING OF NO SIGNIFICANT IMPACT (FONSI) - The Proposed Action entails renovation, demolition, and construction of structures and Marine Corps operations at Robins AFB. Based upon my review of the facts and analyses contained in the EA, which is hereby incorporated by reference, I conclude that the Proposed Action will not have a significant impact on the natural or human environment. An environmental impact statement is not required for this action. This analysis fulfills the requirements of the NEPA, the President's Council on Environmental Quality, and 32 CFR Part 989.


TIMOTHY K. BRIDGES, SES
Director of Communications, Installations
and Mission Support

Date: 5 Sep 07

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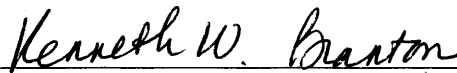
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for
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EXECUTIVE SUMMARY

Based on a final Base Realignment and Closure (BRAC) decision, Marine Forces Reserves (MARFORRES) proposes to relocate various Marine Corps units from Naval Air Station (NAS) Atlanta to Robins Air Force Base (AFB) in Warner Robins, Georgia. 78th Civil Engineer Group, Environmental Management Division (78 CEG/CEV) has conducted an Environmental Assessment (EA) to identify and address potential effects of the Proposed Action at Robins AFB. Only the Proposed Action and the No-Action Alternative received detailed analysis in the EA. The other alternatives failed to meet the criteria for the project and thus were not considered in this EA.

Under the Proposed Action, existing buildings would be renovated, one building would be demolished and a new helicopter maintenance hangar and parking areas would be constructed on the east side of the runway at Robins AFB in support of Marine Aircraft Group (MAG)-42, and Marine Light Attack Helicopter Squadron (HMLA)-773 and Marine Aviation Logistics Squadron (MALs)-42 sub-unit operations. Marine Corps operations would consist of organizing, training and equipping combat-ready squadrons to augment and reinforce active Marine forces in times of war, national emergency or contingency operations; providing personnel and operational relief for the active forces; and providing service to the community. Combat readiness equates to having professionally maintained aircraft and properly equipped and trained Marines to employ those aircraft. Marine Corps operations would begin at Robins AFB in 2010.

Some of the facilities to be renovated for Marine Corps operations are currently occupied by approximately 500 personnel of 19th Air Refueling Group (ARG), which is suspending operations at Robins AFB and relocating to other facilities throughout the United States in 2008. Many of the proposed Marine Corps operations would be similar to operations of 19th ARG, and thus daily maintenance operations would not result in significant impacts to the environment.

Operations would be conducted by approximately 200 to 300 Marine Corps personnel at Robins AFB 5 days a week, and focus on maintenance of 18 H-1 helicopters (12 model

AH-1 and 6 model UH-1) and related training and logistics activities. Noise associated with the Proposed Action would be generated by daily maintenance activities in hangars and adjacent to the airfield, and by helicopter flight operations. Flight operations would occur Monday through Friday between the hours of 0700 and 2200 with approximately eight sorties per day. Approximately 500 to 600 active-duty and Marine Reserves personnel would conduct similar operations during one 2-day drill weekend per month. Drill weekend operations would be similar to daily Marine Corps operations, with 12 helicopter sorties completed per day. Once airborne, helicopter sorties would generally fly an “out and back” route, for approximately 2 hours on average, prior to their return to Robins AFB.

Flight patterns would be in accordance with standard flight operation procedures and strive to avoid identified sensitive receptors, including residences, picnic areas, recreation areas, playgrounds, active sports areas, parks, motels, hotels, schools, churches, libraries and hospitals, around Robins AFB. All departures would be to the northwest, northeast or southeast and would strive to avoid fixed-wing aircraft flight patterns and populated areas. Approaches to Robins AFB would mainly be from the east except when fixed-wing aircraft are already in the flight pattern, which would force the Marines to approach the base from the west. Western approaches are expected approximately 10 percent of time (1 sortie per day).

The average noise decibel level for the helicopter flight operations would be slightly higher (105 decibels [dB]) than aircraft noise levels (average of 99 dB) associated with the 19th ARG's KC-135R that will be leaving Robins AFB prior to Marine Corps arrival. However, noise modeling calculations conducted for both types of aircraft at maximum thrust and a 500-foot distance indicate that the Marine Corps helicopters would generate a similar decibel level to the KC-135R aircraft and a significant adverse impact to noise is not expected. The total number of Marine Corps helicopter sorties would exceed the number of existing 19th ARG sorties on a yearly basis, but after 19th ARG vacates Robins AFB, aircraft noise events that are related to Marine Corps operations would result in only a net 4.5 percent increase per year when compared to current levels. Noise

abatement procedures incorporated into the Marine Corps flight operations would include striving to avoid low-altitude flying near the closest sensitive noise receptors (residences).

The Proposed Action was determined to result in insignificant impacts to the environment. The No-Action Alternative was also determined to result in insignificant impacts to the environment; however, the Marine Corps would not be able to fulfill its mission of Marine Corps combat readiness. Cumulative impacts on the environment from the incremental impact of the Proposed Action when added to other past, present and reasonably foreseeable future actions (such as departure of 19th ARG) were also assessed and, by complying with the requirements of governing regulations, including best management practices, will be insignificant.

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B	Agency / Public Correspondence
C	Calculations
D	Aircraft Noise Background Information and Noise Modeling Results

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ABBREVIATIONS & ACRONYMS

19 th ARG	19th Air Refueling Group
19 th OSS	19 th Operation Support Squadron
78 th CEG/CEV	78th Civil Engineer Group/Environmental Management Division
99 th ARS	99th Air Refueling Squadron
202 nd EIS	Engineering Installation Squadron
AAF	Army Airfield
ACM	asbestos-containing material
ACW	Air Control Wing
AFB	Air Force Base
AFFF	Aqueous Film-Forming Foam
AFOSH	Air Force Occupational Safety and Health
AGE	aerospace ground equipment
AGL	above ground level
AICUZ	Air Installation Compatible Land Use Zone
ALM	A-Weighted Sound Level
APZ	Accident Potential Zone
BASH	Bird/Wildlife Aircraft Strike Hazard
bfe	base flood elevation
bgs	below ground surface
BMP	Best Management Practice
BRAC	Base Realignment and Closure
BTU	British Thermal Unit
BWC	Bird Watch Conditions
CAL	Confined Area Landing
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CRM	Cultural Resources Manager
dB	decibel(s)
dBA	A-weighted decibel(s)
DoD	Department of Defense
DNL	day-night average sound level
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EPA	Environmental Protection Agency
EPD	Environmental Protection Division
EPNL	Effective Perceived Noise Level
EO	Executive Order

ABBREVIATIONS & ACRONYMS (continued)

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FY	Fiscal Year
gpm	gallon(s) per minute
GSE	ground support equipment
HMLA	Marine Light Attack Helicopter Squadron
HPD	Historic Preservation Division
HVAC	heating, ventilation and air conditioning
HWMP	Hazardous Waste Management Plan
HWRP	Hazardous Waste Reduction Plan
INM	Integrated Noise Model
IWTP	Industrial Wastewater Treatment Plant
ISWMP	Integrated Solid Waste Management Plan
LBP	lead-based paint
MAG	Marine Aircraft Group
MALS	Marine Aviation Logistics Squadron
MARFORRES	Marine Forces Reserves
mgd	million gallons per day
MSA	Munitions Storage Area
NAAQS	National Ambient Air Quality Standards
NAS	Naval Air Station
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum of 1929
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PM	particulate matter
PNLT	Tone Corrected Perceived Noise Level
POV	privately owned vehicle
RCRA	Resource Conservation and Recovery Act

ABBREVIATIONS & ACRONYMS (continued)

SEL	Sound Exposure Level
SO _x	sulfur oxides
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
VOC	volatile organic compound

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1.0 INTRODUCTION

78th Civil Engineer Group, Environmental Management Division (78th CEG/CEV) has conducted this Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) to identify and assess potential effects of the Proposed Action and the No-Action Alternative as described in **Section 2**, and evaluated in **Sections 3 and 4**.

Based on a final Base Realignment and Closure (BRAC) recommendation, Naval Air Station (NAS) Atlanta is proposed for closure and tenant organizations are to be relocated to various other Department of Defense (DoD) facilities located throughout the United States, including Robins Air Force Base (AFB). The Marine Forces Reserves' (MARFORRES) proposal to relocate various Marine Aircraft Group (MAG-42) units from NAS Atlanta to various facilities at Robins AFB is addressed in this EA. Environmental impacts related to closure of NAS Atlanta and relocation of various other NAS Atlanta organizations to other facilities is being addressed in separate NEPA documentation as required.

The subject Proposed Action consists of renovation of existing facilities and new construction at Robins AFB, and operation of Marine Corps units relocated from NAS Atlanta to Robins AFB. Existing facilities to be renovated and occupied by Marine Corps personnel are being vacated by 19th Air Refueling Group (ARG) under a separate action. Building renovation and new construction at Robins AFB would be conducted per the Marine Corps units' space and operational requirements.

Specific components of the Proposed Action include: renovation or repainting of existing 19th ARG-occupied hangars and buildings that will be vacated prior to the Proposed Action (Buildings 2061, 2065, 2066, 2067, 2072 and 2083); demolition of Building 2069; construction of a new aircraft hangar and associated hardstand areas; relocation of a roadway adjacent to the new hangar; construction of two new parking lots for privately owned vehicles; and renovation of existing ordnance storage buildings. Renovation and new construction activities would begin in mid 2008 with completion of construction

planned for 2010. Subsequently, various Marine Corps units previously based at NAS Atlanta would be based and conduct operations at Robins AFB.

For ease of understanding, this EA addresses the Proposed Action in three distinct but related components: renovation of existing buildings; construction of new facilities; and operations of Marine Corps units at Robins AFB. In order to better evaluate impacts, this EA describes conditions as they currently exist (with facilities currently occupied by 19th ARG) and as they will exist prior to arrival of Marine Corps units (after the facilities have been vacated by 19th ARG).

78th CEG/CEV provided an opportunity for public and agency review of and comment on the Draft Final EA prior to completion of this Final EA. A public notice was published in the local newspaper, the Houston Home Journal, on 15 June 2007 to announce the availability of the Draft Final EA and copies of the Draft Final EA were sent to the Georgia State Clearinghouse for their receipt on 16 July 2007 and distribution to relevant state regulatory agencies. No comments were received from the public during the 30-day review period. Copies of the responses received from the Georgia Department of Natural Resources Historic Preservation Division, Georgia Environmental Protection Division Hazardous Waste Management Branch, and Georgia Department of Transportation are incorporated into this Final EA and consultation is complete. No other state agencies provided responses on the Draft Final EA. Copies of the public notice and agency correspondence are presented in Appendix B of this Final EA.

2.0 PURPOSE AND NEED AND DESCRIPTION OF ALTERNATIVES

This chapter presents the purpose and need for action, describes the Proposed Action and No-Action Alternative, and summarizes the consequences of implementing the Proposed Action and the No-Action Alternative.

2.1 PURPOSE AND NEED FOR THE PROJECT

Closure of NAS Atlanta is directed pursuant to a BRAC 2005 recommendation. Various Marine Corps units must be relocated as a prerequisite of NAS Atlanta closure, in order to streamline operations and reduce costs associated with national defense. BRAC has directed relocation of MAG-42 and its subordinate units HMLA-773 (Marine Light Attack Helicopter Squadron) and MALS-42 (Marine Aviation Logistics Squadron) from NAS Atlanta to Robins AFB by the end of 2010.

The mission of MAG-42 and support units is to organize, train and equip combat-ready squadrons to augment and reinforce active Marine forces in times of war, national emergency or contingency operations; provide personnel and operational relief for the active forces; and provide service to the community. Combat readiness equates to having professionally maintained aircraft and properly equipped and trained Marines to employ those aircraft. The purpose of the Proposed Action is to provide adequate and efficient space for continued MAG-42, HMLA-773 and MALS-42 operations at Robins AFB so their mission can be achieved.

Robins AFB aircraft maintenance, personnel support and administrative spaces designated for the relocated Marine Corps units are currently occupied by 19th ARG, which is scheduled to vacate Robins AFB in 2008 under a separate action. These facilities were originally developed to support Air Force KC-135R operations and are not necessarily configured for the Marine Corps' space and operational requirements. For example, the existing hangars were designed as fixed-wing nose docks and do not have adequate maintenance shop space to support the designated Marine Corps aviation units. Existing 19th ARG facilities would be remodeled and renovated, as appropriate, to meet

operational requirements of the Marine Corps units. Space for Marine Corps ordnance storage would be provided by renovation and occupation of existing structures in Robins AFB's Munitions Storage Area (MSA).

Due to conflicting aircraft taxiway problems and operational issues, a new hangar, adjacent to the apron, is required for HMLA-773 operations. Construction of the new hangar would include construction of hardstand and additional and replacement parking areas. Re-alignment of Beale Drive would also be required to comply with Anti-Terrorism/Force Protection stand-off requirements for the new hangar.

2.2 REQUIREMENTS OF THE PROJECT

Several requirements were identified in order to fulfill the purpose of the Proposed Action at Robins AFB. The Proposed Action and other Alternatives were screened against the following criteria:

- Compliance with DoD minimum force protection construction standards as outlined in *DoD Minimum Antiterrorism Standards for Buildings* (DoD, 2003): a hangar greater than 150 feet from the controlled perimeter and allowing a 30-foot standoff distance from other structures.
- Ability to provide facilities and/or a site that can be renovated/developed within the timeframe of the relocation (construction to begin in 2008) of the Marine Corps units and NAS Atlanta closure (end of 2010 for completion of construction).
- Ability to provide facilities/a site(s) that can provide for functional and spatial integration of MAG-42, HMLA-773 and MALS-42 functions currently located at NAS Atlanta, in an efficient complex, and providing:
 - Facilities/site(s) with sufficient space to provide administrative support to a complement of 200 to 300 Marines (on a daily basis) and 600 active-duty and Marine Reserves (one weekend per month).
 - Facilities/site(s) that provide for collocation of MAG-42, HMLA-773 and MALS-42 personnel and equipment to facilitate the efficiency of operations.
 - HMLA-773 facilities with sufficient space to provide proper maintenance and personnel support for 18 H-1 helicopters (12 model AH-1 and 6 model UH-1) including: an aircraft hangar that meets clearance height requirements, exterior hazardous material storage, ordnance shop,

maintenance shop, maintenance administration space, tool room, air frame shop, armory life safety room (pilot's gear) and flightline shop.

- Helicopter Hangar with ready access to apron and taxiway.
- MALS-42 facilities with sufficient space to provide proper intermediate level maintenance and personnel support for HMLA-773 unit including: engine production area (repair engines ready for use), bridge crane, new test cell area, test work benches (testing avionics), solder room (for small components), communications center (restricted space), parts storage (new and repairable), classified gear (caged area), miscellaneous shop area, and shipping and receiving areas.
- Parking facilities for a maximum of 300 personnel on a daily basis.
- Locker facilities (900 lockers) to accommodate storage for combat gear for a maximum complement of Marine Corps personnel.
- Munitions storage for aircraft weaponry.

2.3 DESCRIPTION OF PROJECT LOCATION AND PROPOSED ACTION

2.3.1 Description of the Project Location

The Proposed Action location is Robins AFB, located in Houston County in central Georgia, approximately 100 miles southeast of Atlanta, 18 miles south of Macon, and immediately east of the city of Warner Robins (**Figure 1**). MARFORRES proposes to relocate existing MAG-42, HMLA-773 and MALS-42 operations (currently at NAS Atlanta) to the northern portion of Robins AFB along the eastern side of the airfield (**Figures 2 and 3**). This general area is referred to herein as the “east side” of Robins AFB.

2.3.2 Description of the Proposed Action

The Proposed Action consists of demolition or renovation of various existing buildings currently occupied by 19th ARG, renovation of existing ordnance storage buildings and new construction at Robins AFB, and future operations by Marine Corps units as described in the following paragraphs.

Existing 19th ARG-Occupied Facilities to be Renovated and Used by Marine Corps

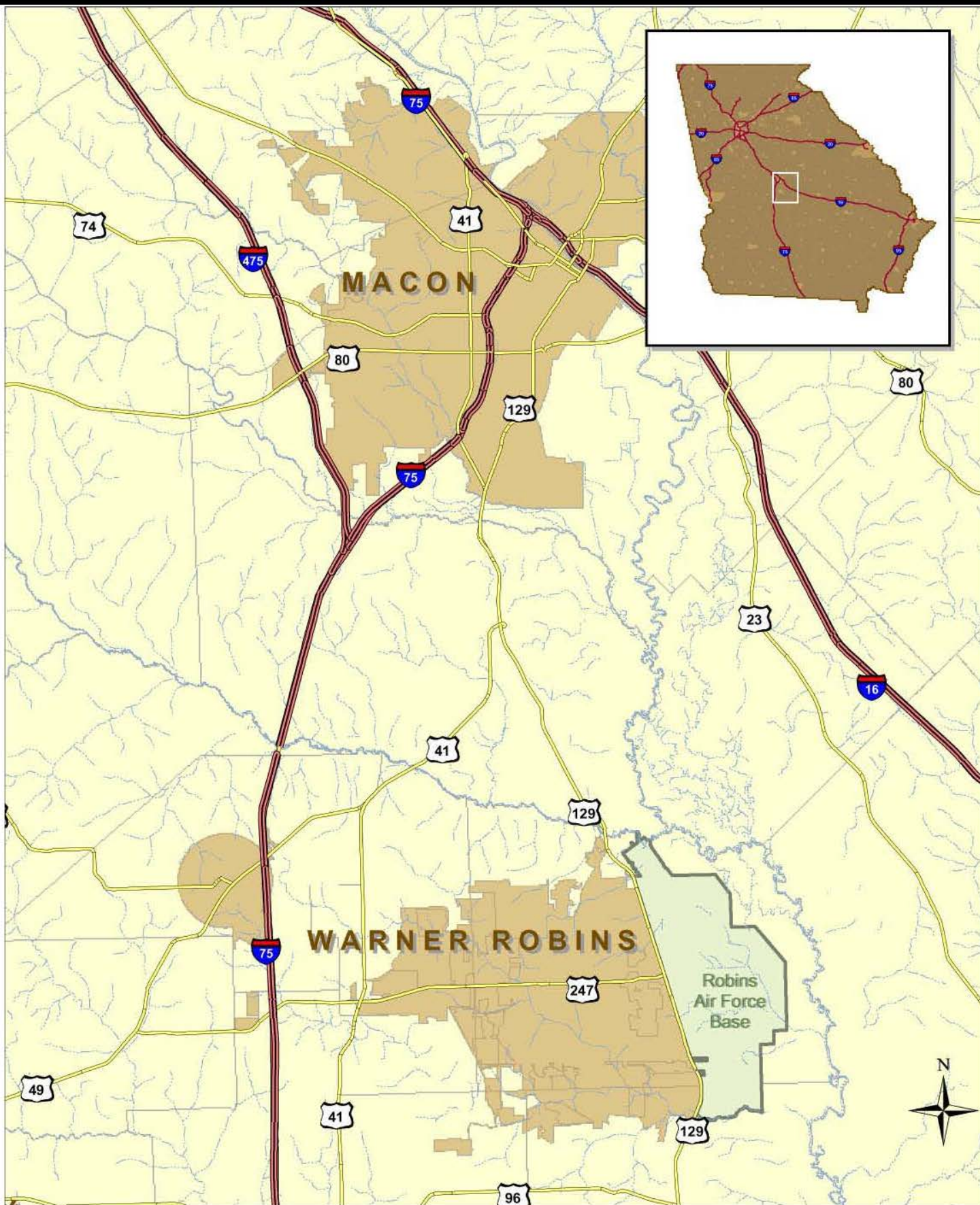
Existing 19th ARG facilities proposed to be occupied by Marine Corps units consist of seven buildings (2061, 2065, 2066, 2067, 2069, 2072 and 2083) located on the east side of Robins AFB (**Figure 4**). Buildings 2061, 2065, 2066, 2067 and 2069 are located along Blunk Drive. Buildings 2072 and 2083 are located along Borghese Drive. Proposed Action components are:

- Existing Building 2061 to be occupied by Marine Corps, with no renovations except exterior painting;
- Existing facility Building 2065 to be renovated and converted to Marine Corps MALS-42 ground supply area building;
- Existing hangar Building 2066, to be renovated as Marine Corps supply warehouse for MALS-42; to include a new concrete pad for hazmat trailer parking, and new restroom facilities to replace those in Building 2069;
- Existing hangar Building 2067, to be renovated as Marine Corps ground supply warehouse;
- Existing facility Building 2083 to be renovated and a concrete ramp for use by forklifts to be constructed, for use as Marine Corps HMLA-773 ordnance work space;
- Existing Building 2069 to be demolished; and
- Existing 19th ARG Headquarters Building (Building 2072) to be remodeled for MAG-42, HMLA-773 and MALS-42 command and administration space.

New Helicopter Maintenance Hangar Area to be Constructed and Used by Marine Corps Personnel

The New Helicopter Maintenance Hangar Area is located on the east side of Robins AFB, adjacent to Beale Drive; rationale for the placement of the new hangar and an associated parking lot in this area is presented in **Section 2.5**.

This area currently consists of the 19th ARG aerospace ground equipment (AGE) storage lot with associated oil/water separator No. 80, parking lot for a shopette (Building 2074), lawn area, atmospheric sensor and an approximate 500-foot section of Beale Drive (**Figure 4**). Proposed Action components are:

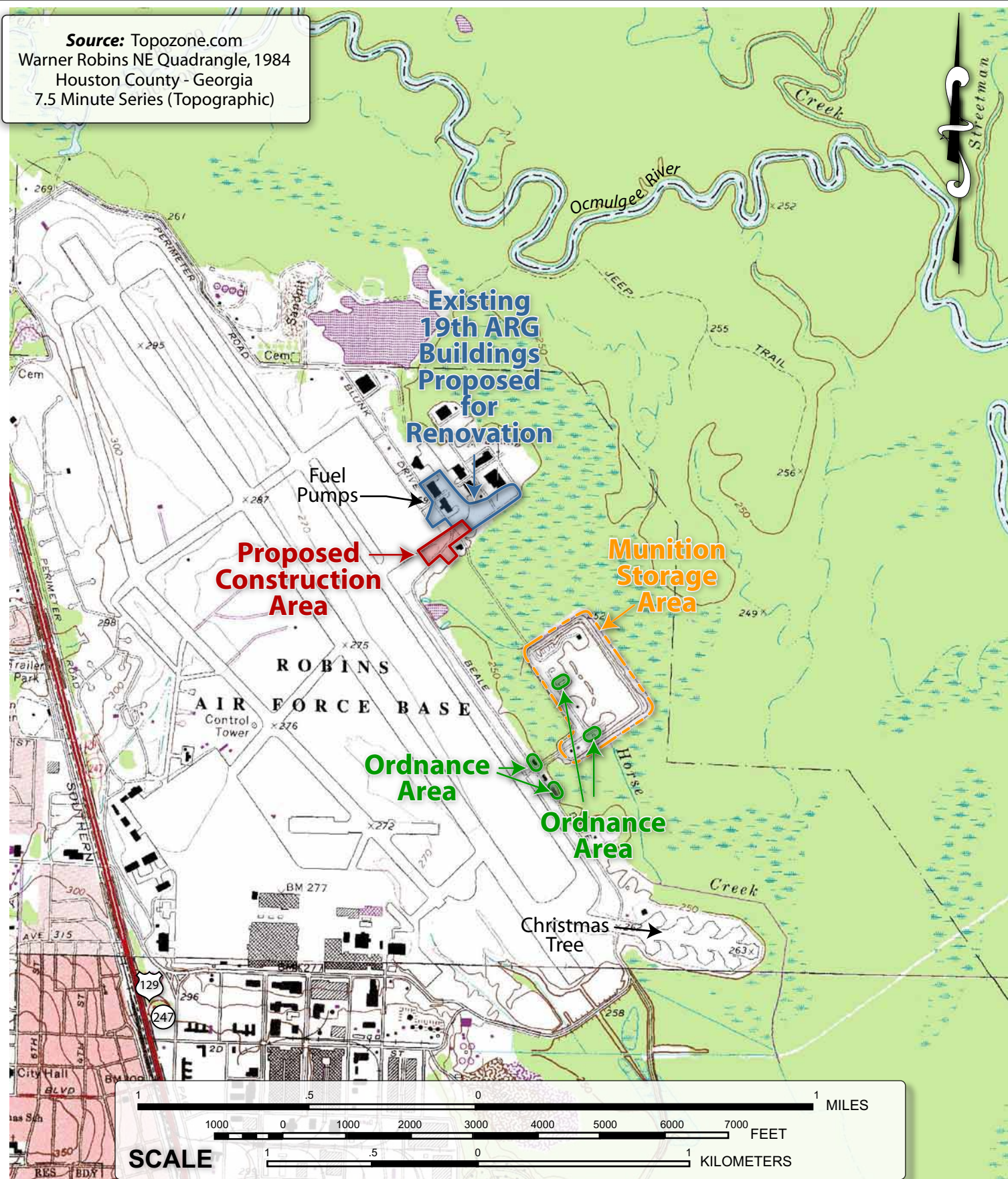


CLIENT:	Robins Air Force Base		
PROJECT:	Environmental Assessment, Various Marine Corps Units at RAFB		
DATE:	January 2007	DESIGNED BY:	
SCALE:	Not to Scale	DRAWN BY:	J. Anderson
FILE:	H:\proj\RAFB\EA Marine BRAC\Figure 1VicinityMap.ai	CHECKED BY:	A. Yarnell



TITLE:	Vicinity Map	
PROJ NO.:	15268128.17000	FIG.:
		1

Source: Topozone.com
 Warner Robins NE Quadrangle, 1984
 Houston County - Georgia
 7.5 Minute Series (Topographic)



CLIENT:		Robins Air Force Base	
PROJECT:		Environmental Assessment, Various Marine Corps Units at RAFB	
DATE:	January 2007	DESIGNED BY:	
SCALE:	1:24000	DRAWN BY:	J. Anderson
FILE:	H:\Proj\RAFB\EA Marine BRAC\Fig 2 Topo.ai	CHECKED BY:	A. Yarnell



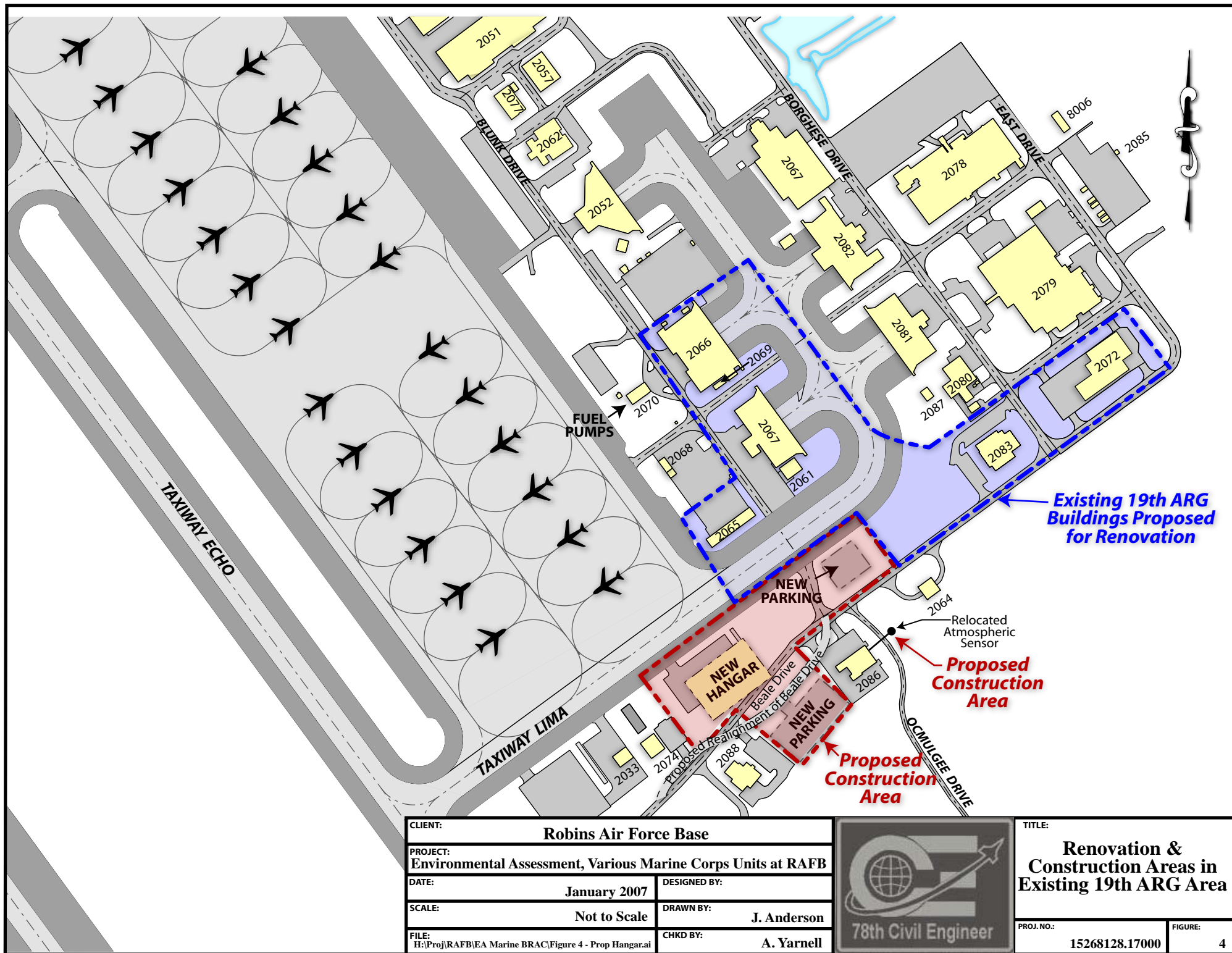
TITLE:		Site Location Map	
PROJ NO.:	15268128.17000	FIG.:	2



CLIENT:	Robins Air Force Base		
PROJECT:	Environmental Assessment, Various Marine Corps Units at RAFB		
DATE:	January 2007	SOURCE:	GoogleEarth.com
SCALE:	Not to Scale	DRAWN BY:	J. Anderson
FILE:	H:\proj\RAFB\EA Marine BRAC\Figure 3- Aerial Map.ai	CHECKED BY:	A. Yarnell



TITLE:	Aerial Map Showing Proposed Project Sites	
PROJ NO.:	15268128.17000	FIG.:
		3



CLIENT: Robins Air Force Base	
PROJECT: Environmental Assessment, Various Marine Corps Units at RAFB	
DATE: January 2007	DESIGNED BY:
SCALE: Not to Scale	DRAWN BY: J. Anderson
FILE: H:\Proj\RAFB\EA Marine BRAC\Figure 4 - Prop Hangar.ai	CHKD BY: A. Yarnell



TITLE: Renovation & Construction Areas in Existing 19th ARG Area	
PROJ. NO.: 15268128.17000	FIGURE: 4

- New 2-story, 40,375-square-foot hangar to be constructed for H-1 helicopters, maintenance and administrative space for HMLA-773. The new hangar would be incorporated into the fenced perimeter area surrounding the airfield with pedestrian access turnstiles for access to the new hangar;
- The existing apron area north of the new hangar to be restriped for helicopter parking use;
- A fire protection detention pond to be constructed east of the new hangar, north of the realigned Beale Drive;
- Additional and replacement privately owned vehicle (POV)/shopette parking areas containing 83 spaces to be constructed southwest, south and east of the new hangar, outside the perimeter fencing with sidewalks to be constructed to connect the parking areas to the new hangar and shopette;
- About 500 feet of Beale Drive to be realigned to accommodate taxiway wing-tip clearance distance and force protection standoff distance requirements of the new hangar construction; and
- Because of its location in the area proposed for new parking, relocation of the atmospheric sensor to the northeast of the Fire Department (Building 2086), within the 100-year floodplain. The sensor, its concrete base and fence would occupy an approximate 56-square foot area, with underground conduit connecting the sensor to the Fire Station.

Ordnance Storage Facilities to be Renovated / Remodeled and Used by Marine Corps

The Marine Corps' proposed ordnance storage area is located on the east side of Robins AFB in the MSA, approximately ½ mile southeast of the existing 19th ARG facilities (**Figure 5**). The MSA currently consists of approximately 25 structures for munitions and ordnance storage, and located within a fenced and secured area. Additional office and warehouse structures are located outside of the secured fenced perimeter. Proposed Action components are:

- Existing materials stored in Buildings 97, 106 and 20008 by 78th Munitions Section to be relocated to other available spaces at Robins AFB; and
- Existing Buildings 97, 106 and 20008 to be renovated and remodeled to provide ordnance storage for Marine Corps.

Because of its location within the explosive safe distance arc of Building 106, a related action includes relocation of 23 116th Air Control Wing [ACW] Tech Data unit personnel

and other non-Munitions personnel occupying Building 9 to other available space at Robins AFB.

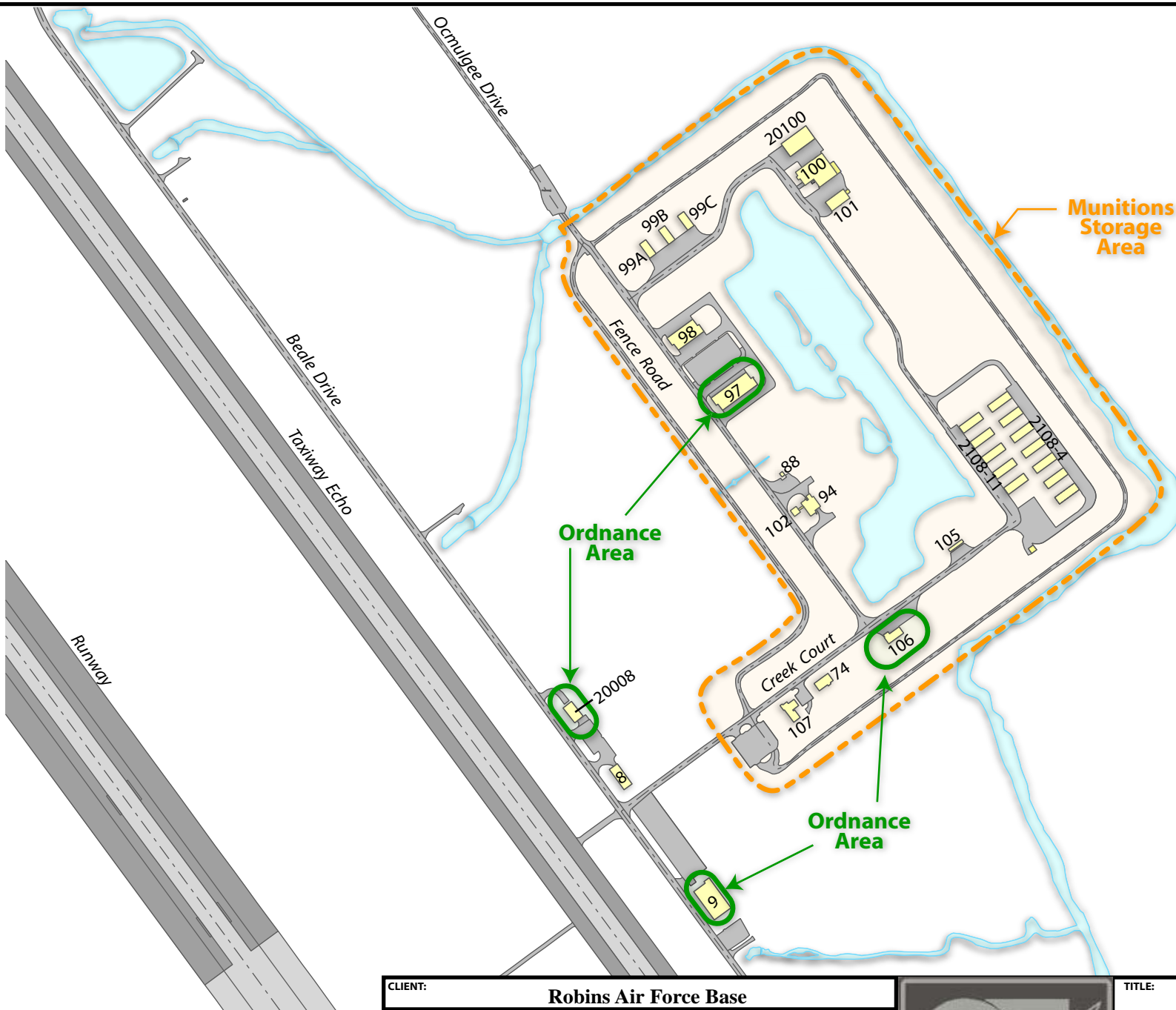
Marine Corps Operations

All the functional requirements and operations listed in **Section 2.2** would be met and occur in association with the relocated Marine Corps at Robins AFB.

Daily Administrative, Maintenance and Flight-Training Operations. On a daily basis, approximately 200 to 300 Marines Corps personnel would perform administrative, maintenance and flight-training operations in the newly renovated and constructed facilities, including approximately 120 personnel in the new hangar.

Ordnance Training Flight Preparation. Ordnance materials would be maintained in the Ordnance Area, with storage occurring in Buildings 97 and 106. Marine Corps personnel would not be assigned to the ordnance buildings, but rather would visit the facilities on an as-needed basis for inspections and preparing for ordnance training flights. When ordnance training flights are to occur, Marine Corps munitions personnel would load ordnance into trucks for transport along Beale Drive to Robins AFB's Alert Area, which is an area known at Robins AFB as the "Christmas Tree" (so named because it is in the shape of a Christmas tree (see **Figure 2**). Ordnance would then be loaded onto helicopters that had been flown from the airfield apron helicopter parking area near the new Marines hangar to the Christmas Tree area for this purpose.

Drill Weekends. Marine drill weekends would occur once a month, beginning Saturdays at 0700 and ending Sundays at 1630. Approximately 500 to 600 active-duty and Reserve Marines personnel would be onsite during these weekends, with approximately 200 personnel working in the new hangar. The main objective of drill weekends is to train Reserve Marines in their job specialty (aircraft maintenance, flight operations, etc.), conduct annual recurring training (rifle range, gas chamber, martial arts training, etc.) and conduct necessary administrative requirements. Drill weekend operations are similar to daily Marine Corps operations; for the purpose of this EA, drill weekend operations are



CLIENT: Robins Air Force Base	
PROJECT: Environmental Assessment, Various Marine Corps Units at RAFB	
DATE: January 2007	DESIGNED BY:
SCALE: Not to Scale	DRAWN BY: J. Anderson
FILE: H:\Proj\RAFB\EA Marine BRAC\Figure 5-OrdnanceArea.ai	CHKD BY: A. Yarnell



TITLE: Ordnance Area	
PROJ. NO.: 15268128.17000	FIGURE: 5

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only discussed where additional operations or personnel could increasingly affect the environmental resources being assessed.

Flight Operations. All Marine Corps flight patterns and flying altitudes would be in accordance with current Robins AFB flight operation procedures and Federal Aviation Administration requirements (minimum 500-foot altitude over objects, including but not limited to structures and vehicles).

Frequency and Type - Helicopter flight operations would occur Monday through Friday between the hours of 0700 to 2200 with approximately 8 helicopter sorties completed per day. Flight operations would also occur on drill weekends during the hours of approximately 0700 to 2200 on Saturday and 0700 to 1600 on Sunday with approximately 12 sorties completed per day. The majority of helicopter sorties would exit Robins AFB airspace for out-and-back flights each lasting approximately 2 hours. Functional check flights would also occur after helicopter maintenance activities are conducted; these flights would involve an approximate 10-mile out-and-back flight.

Training flights would include sliding landing exercises in a grass-covered area adjacent to the northeastern side of the runway. A sliding landing is a routine practice maneuver for landing a skid-configured aircraft. Sliding landings can be accomplished to either improved surfaces (runway or taxiway) or unimproved surfaces (grass area between the runway and the taxiway). The Marine Corps does not incorporate autorotation in sliding landings due to the potential for aircraft damage. In this area, the flight pattern would be a ¼-mile lateral at 300 to 500 feet above ground level (AGL). Flight turns would occur prior to over flight of the 116th ramp and buildings, and all flying would remain within existing airfield boundaries.

Training flights would also involve exiting Robins AFB airspace and flying to Lawson Army Airfield (AAF) at Fort Benning and Fort Stewart for gunnery practice at their live fire ranges. Overnight flights would involve flying to Chattanooga, Tennessee, Tallahassee, Florida and Jacksonville, Florida/St. Simons, Georgia. Flight patterns to these areas would be modified to strive to avoid large fixed-wing aircraft traffic and

noise-sensitive areas. Marine Corps helicopters currently fly to these areas from NAS Atlanta for gunnery practice and flight training. Occasionally, helicopters would return from cross-country flights after normal working hours, but while the airfield is open.

Helicopter Flight Patterns - Each sortie would consist of one or more helicopters departing from the flightline apron helicopter parking area near the new Marines hangar, thereby entering the existing airfield flight pattern. For ordnance training flights (included in the 8 sorties per day mentioned above), Marine Corps H-1 helicopters would be flown from the flightline apron helicopter parking area to the Christmas Tree area and loaded and armed prior to ordnance training flights to existing ranges throughout the southeastern United States.

The helicopters' flight pattern would be closer to the runway than the fixed-wing flight pattern, extend ¼ mile lateral at 500 to 1,000 feet AGL on the west side of the northern end of the runway, and 1/2 mile lateral at 500 to 1,000 feet AGL on the east side of the runway.

Helicopter approaches into the airfield would be flown at minimum 500 feet AGL at 120 knots within airfield boundaries and minimum of 1,000 feet AGL outside of airfield boundaries and over populated areas. All departures would be to the northwest, northeast or southeast and would strive to avoid fixed-wing aircraft flight patterns and populated areas. The Marine Corps helicopter flight pattern outside the base boundary would mainly be oriented to the east of the airfield in order to minimize flying over residential and populated areas. However, if a fixed-wing aircraft was already in the east-side flight pattern, the helicopter flight pattern would be modified and the helicopters would use a west-side approach or departure. Both east-side and west-side approaches are used currently by fixed-wing aircraft; an east-side approach would be used most often (estimated at 90 percent of the time, or approximately 4 sorties during a week) by the Marine Corps. The western-oriented pattern would be used so as not to conflict with fixed-wing traffic, as directed by the tower controller or upon request by the pilot in order to conduct practice approaches in the alternate pattern for proficiency.

Confined Area Landings – At this time, no Confined Area Landing (CAL) sites have been proposed or approved for Marine Corps helicopter operations within Robins AFB boundaries. All CAL operations would be conducted in the off-base Moseby Training Area, which is currently used by the Marine Corps for this purpose.

If CAL sites are needed, or changes occur to the Marine Corps' operational requirements beyond that described in this EA, 78 CEG/CEV will address potential environmental impacts, as required, in separate or supplemental environmental documentation.

A summary of current and future operations including building uses and personnel numbers associated with the Proposed Action is presented in **Table 2-1**, below.

Table 2-1. Summary of Existing and New Facilities Associated with the Proposed Action

Building Number / Area	Current Conditions		Disposition Under the Proposed Action	
	Number ¹ of 19 th ARG Personnel	Purpose / Use	Number ¹ of Proposed Marine Corps Personnel	Purpose / Use
Existing 19 th ARG-Occupied Facilities and Related Areas				
2061	11 - daily	Tire and Wheel Maintenance and Storage	4 - daily; 4 - drill weekends	Occupied by Marine Corps storage area.
2065	7 - daily	Maintenance Area and Storage	4 - daily; 8 - drill weekends	Renovated to accommodate Marine Corps MALS-42 and HMLA-773 ground supply area.
2066 & 2069	75 - daily	Maintenance Area and Storage Hangar and Latrine, respectively	100 - daily; 200 - drill weekends	Building 2066 - Renovated to accommodate the Marine Corps MALS-42 supply warehouse and to include new restroom facilities to replace those in Building 2069. Building 2069 – Demolished.
2067	10 - daily	Maintenance Hangar; National Register of Historic Places (NRHP)-eligible	6 – daily; 25 - drill weekends	Renovated to accommodate the Marine Corps ground supply warehouse; no effect to NRHP status.

Building Number / Area	Current Conditions		Disposition Under the Proposed Action	
	Number ¹ of 19 th ARG Personnel	Purpose / Use	Number ¹ of Proposed Marine Corps Personnel	Purpose / Use
2072	190 - daily	Headquarters for 19 th ARG, 19 th Operation Support Squadron (OSS) and 99 th Air Refueling Squadron (ARS)	40 – daily; 100 - drill weekends	Minor renovations conducted to accommodate the Marine Corps MAG-42, HMLA-773 and MALS-42 administrative building.
2083	1 - daily	Flight Simulator	15 – daily; 25 - drill weekends	Renovated to accommodate Marine Corps ordnance work space area.
Flightline Area	75 - daily	Aircraft Parking and Aerospace Ground Support	N/A	Parking for 18 helicopters
Additional 19 th ARG-Occupied Buildings at Robins AFB	180 - daily	Various 19 th ARG operations	N/A	Not used by Marine Corps; available for other uses.
New Construction Area (for Helicopter Hangar and Parking Areas)				
19 th ARG AGE storage lot	N/A	Aerospace Ground Equipment (AGE) storage	120 – daily; 200 - drill weekends	New helicopter maintenance hangar and hardstand. Asphalt parking lot to be removed.
Building 2074 (Shopette) Parking Lot	N/A	Parking Lot		
Lawn Area and Atmospheric Sensor	N/A	Unused lawn area and Atmospheric Sensor; within 100-year floodplain	N/A	New parking lot for hangar. Atmospheric sensor to be relocated within 100-year floodplain, northeast of Fire Station (Building 2086).
500-Foot Long Section of Beale Drive	N/A	Beale Drive	N/A	About 500 feet of Beale Drive to be realigned to meet taxiway clearance distance and force protection requirements for new hangar.
Ordnance Storage Area				
9	23 ²	116 th Air Control Wing [ACW] Tech Data unit / office space	N/A	Not used by Marine Corps. Building could only be occupied by munitions-trained personnel. Existing personnel in Building 9 would be relocated to other available spaces at Robins AFB.
97	N/A	78 th Munitions Section / warehouse for inert munitions-related storage; NRHP-eligible	3 - daily to weekly	Existing storage relocated to other existing facilities. Renovated to accommodate Marine Corps munitions storage; no effect to NRHP status. Used/inspected daily to weekly.

Building Number / Area	Current Conditions		Disposition Under the Proposed Action	
	Number ¹ of 19 th ARG Personnel	Purpose / Use	Number ¹ of Proposed Marine Corps Personnel	Purpose / Use
106	N/A	78 th Munitions Section / warehouse for inert munitions-related storage; NRHP-eligible	4 - 8 workdays / month	Existing storage relocated to other existing facilities. Renovated to accommodate Marine Corps munitions build-up; no effect to NRHP status. Used as needed.
20008	N/A	78 th Munitions Section / warehouse	4 - 8 workdays / month	Existing storage relocated to other existing facilities. Renovated for Marine Corps ordnance maintenance and equipment/vehicle storage. Used when ordnance evolutions are in progress.
TOTAL	550 ¹ personnel daily (only 400 ¹ 19 th ARG personnel work in the buildings to be occupied by Marine Corps)		200 – 300 ¹ personnel daily; 600 ¹ personnel on drill weekends	

¹ Approximate² 78th Munitions Section personnel

2.4 NO ACTION ALTERNATIVE

Under the No-Action Alternative, no construction or renovation would occur, and designated Marine Corps units would not relocate from NAS Atlanta to Robins AFB or operate at Robins AFB. 19th ARG would still vacate their spaces, as it is a separate action unrelated to the Proposed Action. 19th ARG-occupied spaces would be available for other users at Robins AFB.

The No Action Alternative is not a viable option due to the BRAC directive to close NAS Atlanta and relocate various Marine Corps units to Robins AFB.

2.5 ALTERNATIVES CONSIDERED AND ELIMINATED FROM FURTHER CONSIDERATION

Alternative sites for Marine Corps operations facilities at Robins AFB were also initially considered. The alternatives were compared against the Marine Corps unit's requirements including a site of sufficient size where DoD minimum force protection construction standards could be implemented; where available facilities of similar size and function were in place; where Marine personnel and operations could be collocated in a manner that provided ready access to the airfield taxiway and allowed for the continued efficient performance of maintaining combat-ready aircraft and personnel; and where renovation/construction activities could be performed within the NAS Atlanta closure timeframe (as required under BRAC recommendation). However, no other sites/areas at Robins AFB were identified that met all the requirements described in **Section 2.2**, and thus, none are described or assessed herein.

Several locations and options near the apron in the eastern portion of Robins AFB were initially considered for placement of the new aircraft hangar component of the Proposed Action. These options included renovation of existing hangar spaces occupied by 19th ARG and construction of a new hangar in the area immediately west of existing hangars. Clearance height requirements for Marine Corps helicopters and necessary proximity to the airfield apron eliminated use of existing hangar spaces. Placement of a new hangar in the area to the west of the existing hangars was eliminated because of the presence of existing fuel pumps and the potential of associated soil and groundwater contamination, which would result in an extended timeline (potentially resulting in not meeting the Marine Corps' move-in date in 2010) for remediation activities. These alternative locations and options did not meet requirements for the project as described in **Section 2.2**, and were eliminated from further consideration in this EA. Furthermore, the exact location proposed for the new hangar and associated parking area considered AT/FP building stand-off requirements, stand-off requirements from the centerline of Taxiway Lima to the new hangar door, which considered wing-tip clearance for large/heavy fixed-wing aircraft; air traffic control requirements regarding proximity to active runway 15/33

based on height of the structure; and limitations associated with the existing Security Fence Pop-Up Barrier and other AT/FP restrictions.

The exact placement of the relocated atmospheric sensor considered its function for protecting and the siting requirement for it to be located proximate to the Fire Station (Building 2086); siting beyond the blast arc from the MSA; and required siting within an isolated location. Sites adjacent to Beale Drive and within the proposed new parking area were eliminated from further consideration because they were not sufficiently isolated. Sites in other developed areas were eliminated from further consideration because they were not sufficiently isolated or were too far from or close to the Fire Station building. Only the proposed location met the siting requirements described above and is further evaluated in this EA.

Various options for the Marine Corps' ordnance storage, including construction of a new bunker, were also considered. However, the MSA is surrounded by a wetland and the center of the MSA contains a wetland. Due to stand-off distances between facilities, limited non-wetland ground to build on, and several different groups needing space in the MSA, there is little to no room left on which to build or site new structures without filling of wetlands. Also, Building 97 is an underutilized facility used by 78th Munitions Section that can easily be made available to the Marine Corps. This facility is already rated and approved for the storage of munitions similar to what the Marine Corps requires. Because of these reasons, construction of a new bunker was eliminated from further consideration. Thus, this alternative is not evaluated in this EA.

2.6 COMPARISON OF POTENTIAL EFFECTS

Table 2-2 presents a summary comparison of alternatives receiving detailed evaluation in this EA, which are the Proposed Action (renovation of existing buildings; construction of a new hangar and associated hardstand and parking areas; and operation of Marine Corps units at Robins AFB), and the No-Action Alternative. This EA addresses impacts of the concurrent renovation of existing facilities and construction of new facilities associated with the Proposed Action. Potential cumulative effects are measured by considering

conditions as they currently exist (with facilities currently occupied by 19th ARG), to conditions as they will exist after 19th ARG vacates Robins AFB, and to conditions under the Proposed Action (after facilities have been renovated/constructed and Marine Corps units begin operations). Although 19th ARG's departure from Robins AFB is considered a separate action and is not specifically addressed in this EA, the evaluation of cumulative impacts is best presented in this comparison.

Based on the evaluation contained herein, implementation of the Proposed Action would result in no significant adverse effect. The No-Action Alternative would result in a significant adverse effect by delaying or preventing closure of NAS Atlanta as required by BRAC 2005 recommendations. In addition, the socioeconomic benefits of construction and operating dollars associated with Marine Corps relocation would not occur.

Table 2-2. Comparison of Alternatives Receiving Detailed Evaluation

Phase of Action (C = Construction; O = Operation)		Proposed Action		No-Action Alternative
		C	O	N/A
Environmental Component		+ = Beneficial Effect, --- = Insignificant Adverse Effect, X = Significant Adverse Effect, O = No Effect		
Physical Environment	Topography	---	O	O
	Surface Waters	---	O	O
	Floodplains and Wetlands	---	O	O
	Storm Water	---	O	O
	Geology and Soils	O	O	O
	Groundwater	---	O	O
	Water Supply and Drinking Water	O	---	O
Air Quality		---	---	O
Waste Management and Toxic Materials	Wastewater	O	---	O
	Solid Waste	---	---	O
	Hazardous Materials and Waste	O	---	O
	Toxic Materials	---	O	O
Noise Environment		O	---	O
Biological Environment		O	O	O
Cultural Resources		O	O	O
Socioeconomic Environment		+	+	---
Safety		O	+	O
Transportation		---	---	O
Cumulative Impacts		---	---	---

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3.0 AFFECTED ENVIRONMENT

This section describes the existing environment within the area potentially affected by the Proposed Action and No-Action Alternative. A brief description of the action areas are followed by descriptions of physical environment, air quality, waste management and toxic materials, noise environment, biological environment, cultural resources, socioeconomic environment, and transportation and safety. Discussion of the described elements and resources provides the basis for analysis of potential effects to the environment from the Proposed Action and No-Action Alternative.

Relevant background on Robins AFB is presented in **Appendix A**. Site-specific information presented in this section is derived from on-site evaluation and information obtained from 78th CEG/CEV and other Robins AFB personnel.

For ease of understanding, existing conditions are described for each of the three Proposed Action component locations, referred to herein as “Existing Buildings Occupied by 19th ARG Area,” “Proposed Construction Area” and “Marine Corps Ordnance Area.”

Existing Buildings Occupied by 19th ARG Area

19th ARG provides in-flight worldwide refueling for combat, logistics and combat support aircraft. Operations include the support and maintenance of 13 fixed-wing aircraft, with 19th ARG occupying Buildings 2061, 2065, 2066, 2067, 2069, 2072 and 2083 (and others in the vicinity unaffected by the Proposed Action) as administrative space, maintenance shops and hangars. These facilities and associated parking are located on the eastern side of Robins AFB (see **Figures 2, 3 and 4**). The area is accessible by Beale Drive, Blunk Drive and Borghese Drive. Aircraft associated with 19th ARG are located on the apron west of this area and access the 19th ARG hangars (Buildings 2066 and 2067) via Taxiway Lima. When 19th ARG inactivates from Robins AFB by the end of 2008, these buildings and spaces will be vacant and unused.

116th ACW occupies buildings located north of this area; 116th ACW-occupied spaces and operations are not anticipated to change prior to implementation or as a result of the subject Proposed Action.

Utility lines present within the area include: sanitary wastewater collection system, industrial wastewater collection system, potable water lines, natural gas lines and electrical lines. These utilities are mainly located along roadways paralleling or crossing Beale Drive, Borghese Drive and Blunk Drive. Surface water ditches and limited subsurface drainage lines drain the area and surrounding area.

Proposed New Construction Area

The Proposed Construction Area is located on the eastern side of Robins AFB and is accessed via Beale Drive. It is currently occupied by the paved 19th ARG AGE storage lot with associated oil/water separator (No. 80), the adjacent shopette's parking lot, portions of Beale Drive and grass-covered undeveloped areas (see **Figures 2, 3 and 4**). An atmospheric sensor and a sanitary lift station are located in the grass-covered area south of Beale Drive. Development of the grass-covered area to a parking lot would require relocation of the atmospheric sensor; the proposed new location is located northeast of the Fire Station (Building 2086) parking lot, east of Ocmulgee Drive on the west slope of a drainage channel. At this time, the lift station would not be relocated.

Buildings associated with 19th ARG are located east of this area, and Taxiway Lima followed by the apron is located north of the area.

Utilities present within or bordering the area include the sanitary wastewater collection system, potable water lines, natural gas lines and electrical lines. Sanitary sewer and potable water lines transect the area north to south. Electrical lines are located along Beale Drive, transecting the area east to west. Surface water ditches and limited subsurface drainage lines drain the area and surrounding area.

Marine Corps Ordnance Area

The proposed Marine Corps Ordnance Area is located within the MSA in the eastern portion of Robins AFB along Beale Drive, approximately one half mile south of the Existing Buildings Occupied by 19th ARG Area and the Proposed Construction Area. For the purpose of this EA, the Ordnance Area consists of three existing buildings (Buildings 97, 106 and 20008) currently used for 78th Munitions Section storage. Building 9 contains office space and is currently occupied by non-Munitions 116th ACW personnel.

Buildings 97 and 106 are located within the razor-wire secured MSA. This area was previously built-up and is surrounded by surface water and wetland areas. Buildings 9 and 20008 are located along Beale Drive.

Utility lines within the area include: sanitary wastewater collection system, potable water lines, natural gas lines and electrical lines. Sanitary wastewater and natural gas lines are located parallel to Beale Drive and potable water and electrical lines are located parallel to Beale Drive and within the secured MSA. No formal storm water collection system is present in this area; however, ditches and limited subsurface drainage lines drain the area and surrounding area.

Robins AFB Environs

As described in the Proposed Action description (**Section 2.3.2**), flight patterns for the Marine Corps would for the most part follow flight patterns and altitudes that are currently used at Robins AFB.

3.1 PHYSICAL ENVIRONMENT

The following description of the physical environment of the study areas is based on its principal components: topography, surface waters, floodplains, storm water, wetlands, geology and soils, groundwater and water supply and drinking water.

3.1.1 Topography

Existing Buildings Occupied by 19th ARG Area. Topography at the Existing Buildings Occupied by 19th ARG Area is relatively flat with a gentle slope to the southeast. On-site elevation is primarily approximately 260 ft National Geodetic Vertical Datum of 1929 (NGVD) and approximately 258 ft NGVD in a small area along the southern border.

Proposed Construction Area. Topography at the Proposed Construction Area is relatively flat with a gentle southeasterly slope. On-site elevations range from approximately 260 ft NGVD along the northern border of the area near the ramp to approximately 250 ft NGVD along the southern border. The 19th ARG ramp area was created by bringing in up to 10 feet of fill to a previously known low area around 50 years ago (USACE, 2007b). The southern-most proposed parking lot area is located next to an existing wetland and is surrounded by terrain 6 to 8 feet higher on the east, north and west sides; slopes range from 4 to 12 percent (USACE, 2007b). The proposed site for the new atmospheric sensor is on the western slope of a drainage channel, with the sensor to be located at approximately 252 ft NGVD.

Ordinance Area. Topography at the Ordinance Area is relatively flat. Areas along Beale Drive gently slope to the east. Areas within the secured MSA have been built-up and have steeper slopes on all sides, with an elevation of approximately 260 ft NGVD.

3.1.2 Surface Waters

The upland portion of Robins AFB is drained by four intermittent streams that flow west to east into the Ocmulgee floodplain. Surface water drainage on the northern portion of base generally flows from west to east from SR 247 to Horse Creek (the primary perennial stream on base), then to the wetlands east of base, and eventually to the Ocmulgee River. Horse Creek starts along the eastern perimeter of the runway area and flows southeast through Ocmulgee floodplain wetlands before leaving base property and entering the Ocmulgee River.

Existing Buildings Occupied by 19th ARG Area. No surface water is located on the site and the area and its operations do not directly impact surface waters. The nearest surface water feature is the wetland area located to the south, across Beale Drive (see **Figure 2**). The wetland area discharges to Horse Creek.

Proposed Construction Area. The area has no surface water located on it and does not directly impact surface waters. The nearest surface water feature is the wetland area located to the south (see **Figure 2**), which discharges to Horse Creek.

Ordinance Area. The area has no surface water located on it and does not directly impact surface waters. The area is surrounded by wetland areas and Horse Creek to the north, east and south, a tributary of the Ocmulgee River (see **Figure 2**).

3.1.3 Floodplains and Wetlands

Most of the landforms on and around Robins AFB have been affected by the Ocmulgee River, which is one of the dominant watercourses in west-central Georgia and is part of the Altamaha River drainage. The Ocmulgee River floodplain is about 3 miles wide from bluff to bluff at Robins AFB. The distance from the westernmost bluff of the floodplain on base to the river averages about 2 miles. Nearly all of the Ocmulgee River floodplain at Robins AFB falls into Zone A, the area of 100-year floods.

Approximately 32 percent of Robins AFB is wetlands. Significantly more than half of all the wetlands on base are associated with the Ocmulgee floodplain. Wetlands in the Ocmulgee River floodplain are seasonally and semi-permanently flooded. Most of the wetlands on Robins AFB are broad-leaved deciduous, forested, palustrine wetlands.

Existing Buildings Occupied by 19th ARG Area. Based on review of the Robins AFB Floodplain Map (Robins AFB, 2006), an effective Flood Insurance Rate Map (FIRM) (FEMA, 1996) and site observations, small areas in the southern portion of the existing building area are located within the 100-year floodplain of Ocmulgee River. The effective flood zone is identified as approximate flood hazard area A, with no determined

base flood elevation (bfe) within this area. No jurisdictional wetlands are located in the existing building area. The nearest wetland area is located to the south, across Beale Drive (see **Figure 2**). No operations at the area directly impact floodplains or wetlands.

Proposed Construction Area. Based on review of the Robins AFB Floodplain Map (Robins AFB, 2006), the effective 1996 FIRM, the January 2007 topographic survey for the area and site observations, the northern portion of the Proposed Construction Area, north of Beale Drive is located at 260 ft NGVD, and outside the 100-year floodplain. The area south of Beale Drive slopes to elevation 250 ft NGVD, and is within the 100-year flood zone. Jurisdictional wetlands are located just beyond the proposed southern parking lot, also within the 100-year flood zone. The proposed atmospheric sensor location is located within the 100-year floodplain and outside the jurisdictional wetland area. Area operations do not currently directly impact floodplains or wetlands.

Ordinance Area. Based on review of Robins AFB Floodplain Map (Robins AFB, 2006), the effective 1996 FIRM and site observations, the western portion of the Ordinance Area, including Buildings 9 and 20008 are not located within the 100-year floodplain. The eastern portion of the Ordinance Area, including Buildings 97 and 106 are located in an area that has been built-up above the flood elevation. The MSA is surrounded by and includes wetland areas (see **Figures 2 and 5**). No area operations directly impact floodplains or wetlands.

3.1.4 Storm Water

Stormwater from the north-central portion of the base flows along natural, intermittent streams and man-made drainage features into Horse Creek.

Existing Buildings Occupied by 19th ARG Area. Current operations and activities within the area do not adversely impact storm water quality. Existing buildings receive limited runoff from the adjacent area to the north and west; however, no indications of adverse environmental impacts were observed during a site reconnaissance in August 2006. Precipitation falling onto the area generally infiltrates vegetated areas or is directed

as sheet flow to the on-site storm water sewer system, which discharges into adjacent wetland areas.

Proposed Construction Area. Current operations and activities within the area do not significantly adversely or significantly positively impact storm water quality. The Proposed Construction Area does receive limited runoff from the adjacent area to the north and west; however, no indications of adverse environmental impact were observed during a site reconnaissance in August 2006. Precipitation falling onto the area generally infiltrates vegetated areas or is directed as sheet flow to on-site oil/water separator No. 80, which discharges to the storm sewer system.

Ordinance Area. Current operations and activities within the area do not adversely impact storm water quality. Existing buildings receive limited runoff from the adjacent area to the west; however, no indications of adverse environmental impact were observed during a site reconnaissance in January 2007. Precipitation falling onto the area generally infiltrates vegetated areas or is directed as sheet flow to adjacent wetland areas.

3.1.5 Geology and Soils

Existing Buildings Occupied by 19th ARG Area. Many of the soils in the vicinity of existing buildings have been disturbed due to construction; some of the area was reclaimed from wetlands and the ground surface elevation was raised with fill dirt during the late 1950s prior to construction of several of the buildings. The U.S. Department of Agriculture (USDA) classified soils on the eastern portions of this area as “Lucy sand, 0 to 5 percent slopes,” which is described as deep, well-drained and somewhat excessively drained soil on uplands (USDA, 1967). Soils on the western portions of the area are classified as “Orangeburg loamy fine sand, 2 to 5 percent slopes,” which is described as a deep, well-drained soil on very gentle sloping uplands (USDA, 1967). Current area operations are not known to adversely impact on-site or off-site soils.

Fuel-contaminated soils associated with previous groundwater contamination are potentially present near the fuel pumps, west of Buildings 2066 and 2067.

Proposed Construction Area. Soils within the Proposed Construction Area have been disturbed by previous filling, grading, and construction activities. The USDA classified soils in this area as “Orangeburg loamy fine sand, 2 to 5 percent slopes,” which is described as a deep, well-drained soil on very gentle sloping uplands (USDA, 1967). A geotechnical investigation performed in support of design of proposed facilities found that fill materials consisting of silty sand, clayey sand and boiler slag described as gravelly poorly graded sand are present north of Beale Drive in the proposed hangar construction portion of this area; areas proposed for future parking lots were underlain by clayey sands and silty sands. Current area operations are not known to adversely impact on-site or off-site soils.

Ordinance Area. Many of the soils in the vicinity of the Ordinance Area have been disturbed through construction, and fill soils have been added to raise the area above the 100-year floodplain level. The USDA classified the original soils on the area as “Swamp,” described as likely to be flooded frequently and covered with water for long periods (USDA, 1967). Current area operations are not known to adversely impact on-site or off-site soils.

3.1.6 Groundwater

Existing Buildings Occupied by 19th ARG Area. Current and past operations and land uses associated with these buildings are not known to have adversely impacted groundwater. Groundwater contamination by jet fuel was previously detected west of Buildings 2066 and 2067 near the fuel pumps. The contaminated groundwater plume emanated from underground leaking lines associated with USTs at the fuel pumps and previously extended to the east of Buildings 2066 and 2067, as the buildings are down-gradient from the contaminated area. Groundwater remediation activities were conducted for several years to address the identified free product. The contamination plume receded and Georgia Environmental Protection Division issued a No Further Action for this area. No groundwater treatment systems are in operation within this area.

Based on nearby groundwater wells, groundwater depth is less than 10 feet below ground surface (bgs) in the area.

Proposed Construction Area. Current and past operations and land uses within the Proposed Construction Area are not known to have significantly adversely or significantly positively impacted groundwater. No groundwater contamination is known to exist and no groundwater treatment systems are in operation on or in the immediate vicinity of the Proposed Construction Area. A groundwater monitoring well was previously located on site; contamination was not detected in the well and it was decommissioned in 2006.

Based on nearby groundwater wells, groundwater depth is less than 10 feet bgs in the area.

Ordinance Area. Current and past operations and land uses at the Ordinance Area are not known to have significantly adversely or significantly positively impacted groundwater. No groundwater contamination is known to exist and no groundwater treatment systems are in operation on or in the vicinity of the Ordinance Area.

Based on topographical features, it is estimated that groundwater depth is less than 10 feet bgs in the area.

3.1.7 Water Supply and Drinking Water

The existing water system consists of water supply wells, water pumping stations, treatment equipment, and distribution piping (approximately 625,000 feet with the main supply in a loop configuration). It serves approximately 19,800 military, civilian, and contractor personnel and provides necessary water for the base's workload. All water supplied to base is derived from groundwater wells located on base. Robins AFB is permitted to operate their water system under state of Georgia Permit No. CG1530042. By operating in compliance with permit requirements, the base ensures that it meets Federal and Georgia Safe Drinking Water Act requirements. The base has an active cross

connection/backflow prevention program as well as an active program to exercise the potable water valves.

Currently, there are eight groundwater wells on Robins AFB. Seven of these wells are in use for supplying the potable water system. The capacity of these seven wells is 10.56 million gallons per day (MGD) but constant use at this rate is not possible due to aquifer and permit limitations. Average water use during the past year (2006) was 3.3 MGD. Average water use during the peak month was 4.3 MGD. The current operating permit limits withdrawal of water to 3.87 MGD (as an annual average) and 5.01 MGD (as a monthly average).

Existing Buildings Occupied by 19th ARG Area. No groundwater drinking wells are located adjacent to the existing buildings; a water tower and groundwater well are located adjacent to the eastern boundary of the area. Potable water distribution pipes are located throughout the existing building area, paralleling the apron, Blunk Drive and Borghese Drive. Water is provided to existing buildings for restrooms and break rooms, which support approximately 400 personnel.

Potable water is consumed 5 days a week by approximately 400 19th ARG personnel that occupy these buildings. Once 19th ARG departs, no water consumption will occur in these buildings. Refer to **Appendix C** for water consumption and wastewater generation calculations.

Proposed Construction Area. No groundwater drinking wells are located within boundaries of the Proposed Construction Area. Potable water distribution pipes are located near the northern boundary of the site, paralleling Taxiway Lima. Water is not currently used within the Proposed Construction Area.

Ordinance Area. No groundwater drinking wells are located within the boundaries of the Ordinance Area. Potable water distribution pipes are located throughout the area, including parallel to Beale Drive. Water is provided to existing buildings for the fire

protection systems and restrooms; with only Building 9 being staffed (approximately 23 personnel) on a regular basis.

3.2 AIR QUALITY

3.2.1 Regional Air Quality

In the 1970 Amendments to the Clean Air Act, the U.S. Environmental Protection Agency (EPA) was required to establish National Ambient Air Quality Standards (NAAQS). EPA established two levels of protection for the NAAQS, i.e., primary standards and secondary standards. The primary standards are designed to protect the public health and are set at levels that will protect the most sensitive individual. The secondary standards are meant to be equal to or more stringent than the primary standards and are designed to protect the public welfare. NAAQS now exist for six criteria pollutants, i.e., carbon monoxide (CO), lead, nitrogen oxides (NO_x), ozone, particulate matter (PM), and sulfur dioxide (SO_x). Robins AFB is located in an attainment area, which means that the NAAQS are being met in the surrounding area (Houston County). Additional information regarding air quality at Robins AFB is presented in **Section 4.0** of **Appendix A**.

3.2.2 Air Emission Sources

Robins AFB is compliant with its Title V permit issued on November 14, 2003 (Air Quality Permit #9711-153-0033-V-01-2). Additional information related to the Title V program is presented in **Section 4.3.5** of **Appendix A**, and additional information related to air emission sources at Robins AFB is presented in **Section 4.2** of **Appendix A**.

Existing Buildings Occupied by 19th ARG Area. Air quality in the vicinity is primarily affected by its proximity to the flightline. Mobile source air emissions associated with the buildings to be renovated for the Marine Corps are currently generated by 19th ARG-associated personnel POVs, AGE and 13 KC-135R aircraft. Emissions from POVs and AGE are an insignificant part of total air emissions associated with 19th ARG operations.

19th ARG operates approximately 780 sorties per year or approximately 3 sorties per day. These sorties generate approximately 1.3 tons of volatile organic compounds (VOC) per year and other air emissions, including PM 10 and 2.5 (aerodynamic diameter less than 10 and 2.5 microns, respectively), CO, NO_x and SO_x, as identified in **Table 3-1**. Refer to **Appendix C** for air emission calculations.

Table 3-1. 19th ARG KC-135R Annual Air Emissions

Air Contaminant	PM10 (tons/year)	PM2.5 (tons/year)	CO (tons/year)	NO _x (tons/year)	SO _x (tons/year)	VOC (tons/year)
KC-135R	13.67	13.67	40.96	12.92	0.97	1.32

* These air emissions were calculated with emission factors documented in AF IERA, 2002.

KC-135R aircraft will vacate Robins AFB along with 19th ARG's departure in 2008.

Stationary air emissions associated with 19th ARG include an emergency generator associated with Building 2072, which operates on an as-needed basis. Additionally, 19th ARG shares painting areas with 116th ACW. The minimal amount of painting performed by 19th ARG is estimated to generate less than one ton of air emissions per year. Air emissions specifically generated by 19th ARG are difficult to identify as their activities are performed in conjunction with 116th ACW activities.

After 19th ARG departs Robins AFB, the buildings they occupy will be vacant and 19th ARG-associated air emissions will not be generated. Total air emissions in this area will be less than at present.

Proposed Construction Area. No significant air emissions are currently being generated within the area. No air emissions are generated by the atmospheric sensor. Mobile source air emissions are currently generated by vehicles traveling along Beale Drive, and air quality is primarily affected by aircraft on the flightline.

Ordinance Area. Mobile source air emissions are currently generated by vehicles within the area and traveling on adjacent Beale Drive. Building 9 operates an emergency

generator on an as-needed basis, which generates air emissions. No other significant air emissions are currently being generated within the Ordnance Area.

3.3 WASTE MANAGEMENT AND TOXIC MATERIALS

3.3.1 Wastewater

Sanitary sewage generated by the base is treated at Robins AFB's sanitary sewage treatment plant, and effluent is monitored for biological oxygen demand, chemical oxygen demand, coliform bacteria, pH, oil and grease, ammonia, metals, suspended solids and chlorine. Discharges are currently within National Pollutant Discharge Elimination System permit limits.

Industrial wastewater generated by the base is processed through one of two industrial wastewater treatment plants. Industrial wastewater treatment plant (IWTP) No. 1 treats all industrial waste with the exception of waste from the Plating Shop, which is processed at IWTP No. 2. Treated effluent from IWTP No. 1 is discharged to the sanitary wastewater treatment plant for additional treatment prior to discharge. Effluent from IWTP No. 2 is directly discharged into the Ocmulgee River.

The current design of the IWTP system results in combined sludge waste streams after treatment in IWTP Nos. 1 and 2. Currently, sludge from IWTP No. 1, combined with that from IWTP No. 2, are sent to Building 352 for dewatering and then are collected in bins and disposed of at an off-base recycling facility.

The IWTP system currently is able to treat industrial wastewater from the base within permit discharge limits. This should not be affected by normal process modifications in the future. Recent process changes have reduced the amount of hazardous chemicals (particularly cyanide) in industrial wastewater, and ongoing programs to minimize use of hazardous materials on-base should effectively increase the capacity of the IWTP to meet discharge limits.

Existing Buildings Occupied by 19th ARG Area. Sanitary sewer service is currently provided to these existing buildings, supporting approximately 400 19th ARG personnel. Building 2083 operates an oil/water separator, which discharges into the storm water system and sanitary wastewater system, respectively. Building 2067 previously operated an oil/water separator which was removed in December 2006. Soil sampling conducted at the time of removal indicated no soil contamination from the oil/water separator.

After 19th ARG departs Robins AFB, buildings they occupy will be vacant and 19th ARG-associated wastewater will not be generated. No wastewater will be generated as no operations will be occurring in the subject buildings.

Proposed Construction Area. Wastewater is not currently generated within the Proposed Construction Area. An oil/water separator associated with the apron and AGE storage lot is present within the site. The oil/water separator is used for storm water runoff from the adjacent areas, and discharges into the storm water system.

Ordinance Area. Sanitary sewer service is currently provided to Buildings 9 and 20008; sanitary sewage is generated by the 23 personnel who work in this building. Buildings 97 and 106 do not currently generate wastewater.

3.3.2 Solid Waste

Solid wastes are generated from all areas of Robins AFB, including base housing, municipal operations, office complexes, industrial facilities, and construction/demolition areas. An *Integrated Solid Waste Management Plan* (ISWMP) has been developed to establish an integrated approach to dealing with solid waste management issues at Robins AFB. The approach includes source reduction, recycling, and disposal. Solid wastes that cannot be recycled are collected and transported to the Houston County landfill for disposal. Houston County has committed to providing solid waste disposal services to Robins AFB and has a permitted facility with 40 years of useful life. Approximately 50 years of additional capacity could be acquired through expansion of the landfill if needed. Solid wastes destined for recycling are collected at various locations on base in waste-

specific containers or are turned in to the Defense Reutilization and Marketing Office (DRMO).

Existing Buildings Occupied by 19th ARG Area. Solid waste associated with existing buildings includes typical office waste, kitchen waste, paper, plastics, metal and glass containers and standard housekeeping materials, and is handled in accordance with Robins AFB's ISWMP; the amounts are considered insignificant compared to overall solid waste generation at Robins AFB. 19th ARG recycles paper, cardboard, aluminum and print cartridges. No other solid waste is currently generated within these buildings.

After 19th ARG departs Robins AFB, the buildings they occupy will be vacant and 19th ARG-associated solid waste will not be generated. No solid waste will be generated as no operations will be occurring in the subject buildings.

Proposed Construction Area. No solid waste is generated within the Proposed Construction Area.

Ordinance Area. Solid waste associated with the existing buildings includes typical office waste, kitchen waste, paper, plastics, metal and glass containers and standard housekeeping materials, and is handled in accordance with Robins AFB's ISWMP; the amounts are considered insignificant in comparison to overall Robins AFB solid waste generation. No other solid waste is currently generated at the area.

3.3.3 Hazardous Materials and Waste

Robins AFB has implemented a *Hazardous Waste Reduction Plan* (HWRP, 2006) that focuses on reducing or eliminating use of hazardous materials. Hazardous materials are stored and handled in accordance with Occupational Safety and Health Administration (OSHA) regulations 29 Code of Federal Regulations (CFR) 1910.1200(e) through (h), *Hazard Communication*. Hazardous waste is managed under the Resource Conservation and Recovery Act (RCRA) *Standards Applicable to Generators of Hazardous Waste* (40 CFR Part 262), Georgia Rule 391-3-11, *Hazardous Waste Management*, and Robins

AFB's Hazardous Waste Facility Permit. Universal waste is stored and handled in accordance with the *Standards for Universal Waste Management* (40 CFR Part 273). All hazardous waste is handled and disposed of in accordance with Robins AFB's *Hazardous Waste Management Plan* (HWMP) and all local, state and Federal regulations.

Existing Buildings Occupied by 19th ARG Area. 19th ARG operates maintenance shops and conducts painting operations in nearby 116th ACW facilities. Hazardous materials including diesel for emergency generators, oils, hydraulic fluids, lubes and solvents that are located within 19th ARG maintenance shops and used by 19th ARG. Paint and associated cleaners and adhesives are stored in 116th ACW painting facilities. Jet fuel for 19th ARG KC-135R aircraft is stored in base storage tanks located in the vicinity of the apron, and delivered to aircraft on the apron for fueling by tanker vehicles or directly from fuel pits located at several of the aircraft parking spots.

Hazardous waste generated by maintenance operations includes sealant/adhesives, bulk industrial waste and rags. 19th ARG operations generated approximately 660 pounds of hazardous waste for calendar year 2006.

After 19th ARG departs Robins AFB, the buildings they occupy will be vacant and 19th ARG-associated hazardous waste will not be generated. No hazardous waste will be generated as no operations will be occurring in the subject buildings.

Proposed Construction Area. No hazardous materials are stored and no hazardous waste is currently generated within the Proposed Construction Area.

Ordinance Area. Inert munitions are currently stored in Buildings 97 and 106. An emergency generator that stores diesel is associated with Building 9. No other hazardous materials are stored and no hazardous waste is currently generated within the Ordinance Area.

3.3.4 Toxic Materials

A base-wide asbestos survey for friable asbestos-containing material (ACM) was completed in March 1988. Known friable ACM then was removed in four phases, and continues to be removed from base facilities through renovation and construction activities. ACM surveying and sampling are included in renovation and construction project activities and costs for ACM removal also are included in renovation/construction project cost estimates.

Robins AFB completed inspection and removal of all transformers and other large capacitors containing polychlorinated biphenyls (PCBs) at concentrations greater than 50 parts per million in July 1991, thereby achieving “PCB-free” status. PCB management programs now focus on proper disposal of smaller capacitors, including fluorescent light ballasts that are not regulated under TSCA but pose a risk of liability to the base under CERCLA if they are disposed of as municipal solid waste and contaminate municipal landfills.

Existing Buildings Occupied by 19th ARG Area. Comprehensive surveys for ACM, lead-based paint (LBP) and PCB-containing equipment have not been performed in Buildings 2061, 2065, 2066, 2067, 2069, 2072 and 2083. A review of survey records by Robins AFB personnel did not identify any survey information for these buildings. Given the construction dates, a potential exists for these toxic materials to be present in the structures.

Thirteen (13) bulk samples were collected from four buildings (Buildings 2065, 2066, 2067 and 2069), as presented in an Environmental Evaluation report (ESA Environmental Specialists, March 8, 2007) to assess potential hazardous environmental implications or concerns that may affect the upcoming renovation/demolition activities. Only one of the materials sampled (heating, ventilation and air conditioning [HVAC] duct mastic from Building 2066) was identified as asbestos containing. The potential exists for additional asbestos-containing materials to be present in these buildings.

Sample results for twelve (12) paint samples that were collected from three buildings (Buildings 2066, 2067 and 2069) as part of the Environmental Evaluation referenced above indicate that lead was detected in all of the paint samples at levels exceeding the laboratory detection limit. Lead was identified in five of the samples (collected from Buildings 2066, 2067 and 2069) above the 0.5 percent lead by weight limit considered LBP by U.S. Environmental Protection Agency.

No PCB-containing transformers are associated with Buildings 2065, 2066, 2067 and 2069; the light ballasts are potentially PCB-containing (ESA, 2007).

Proposed Construction Area. No ACM or LBP is located within the Proposed Construction Area. Nor is PCB-containing equipment located within the boundaries of this area. A small amount of radioactive material is present in the atmospheric sensor; the material is wholly contained and not exposed to the environment. The sensor does not contain oils or any other potential contaminants.

Ordinance Area. Comprehensive surveys for ACM, LBP and PCB-containing equipment have not been performed in Buildings 9, 97, 106 and 20008. Asbestos is present in Building 106, based on survey records reviewed by Robins AFB personnel. No other information was identified for these buildings. Given the construction dates, the potential exists for ACM, LBP and PCB-containing fluorescent light ballasts to be present in the structures.

3.4 NOISE ENVIRONMENT

Noise is an "unwanted or unwelcome" sound that is usually caused by human activity added to the natural acoustic setting of a locale. It is further defined as sound that disrupts normal activities or that diminishes the quality of the environment. Community response to noise is generally not based on a single event, but on a series of events over time. Factors that may affect subjective assessment of the daily noise environment include the noise levels of individual events, the number of events per day and the time of day at which the events occur. Propagation of sound is affected by various other factors

including meteorology, topography and barriers. Sensitive noise receptors can include residences, picnic areas, recreation areas, playgrounds, active sports areas, parks, motels, hotels, schools, churches, libraries and hospitals.

Additional background information on noise is presented in **Appendix A, Section 8.0** and in **Appendix D**.

Robins AFB Environs. Significantly loud noise events at Robins AFB and surrounding areas are dominated by aircraft operations associated with the base. During Fiscal Year (FY) 06, Robins AFB had an average of 79.7 flight operations per day for a total of 28,698 operations per year; of these, approximately 780 sorties were associated with 19th ARG. Other noise sources such as construction activities or heavy machinery are minor in comparison to the aircraft noise generated on approach, landing and take-off and during maintenance-related engine runs.

Robins AFB completed noise modeling in 1997 as part of an Air Installation Compatible Use Zone (AICUZ) study (Middle Georgia Regional Development Center, 2004). The AICUZ is primarily concerned with identifying areas with elevated noise levels (greater or equal to 65 decibels) in order to promote compatible land uses (refer to **Appendix A, Section 8.0**). (65 decibels is the maximum background noise level determined by scientific research to allow acceptable outdoor conversation in a normal voice and is below the sound level established to protect against hearing loss.) On-base personnel expect elevated noise levels and are protected in accordance with DoD and OSHA health and safety requirements, where applicable. The noise modeling contours were based on the Day-Night Average Noise Level (DNL), in units of decibels (dB). The annual average DNL is a descriptor used by the Air Force to assess exposure to aircraft noise, predict community response to various noise levels and identify compatible land uses. DNL values for land use planning are 65, 70, 75 and 80+ dB; when DNLs are below 65 dB, no land use restrictions are required, and the Air Force suggests no residential development where DNLs are greater than 65 dB. However, if residential dwellings are present where DNLs are greater than 65 dB, it is suggested that the dwellings incorporate noise-reduction measures. Commercial and/or retail land use is not compatible where

DNLs are above 80 dB, and buildings should incorporate noise-reduction measures where DNLs are 70 to 80 dB. Industrial land use is generally compatible with all DNLs, as are most agricultural and open space land uses.

Information regarding the noise environment at Robins AFB is presented in **Section 8.0** of **Appendix A**.

Existing Buildings Occupied by 19th ARG Area. Noise associated with normal operational activities in this area is typical of office buildings, maintenance shops and hangars. The area includes and is adjacent to an active apron and taxiways and therefore is subjected to aircraft operations and noise. Noise is generated by vehicles on adjacent roadways, but is primarily generated by aircraft departing and landing on the airfield. Based on available noise modeling data as presented in the AICUZ, the area is located within an area subject to less than 75 dB DNL.

Based on a review of current surrounding land uses, the nearest residential sensitive noise receptors are located approximately 1¾ miles to the north (civilian residential); approximately 2¼ miles to the east (civilian residential); approximately 1½ miles to the southwest (military residential); and approximately 1 mile to the west (civilian residential), and outside the 65 dB DNL noise contour.

19th ARG operations include flying and engine maintenance activities. 13 KC-135R aircraft associated with 19th ARG operates at 99 dB (Boeing, 2007) and are flown a total of approximately 3 sorties per day. Weekend flying occurs infrequently, and only for a particular task. Special operations missions require nighttime flying approximately twice a week. Maintenance engine runs are typically not allowed during the hours from 2200 to 0700 unless approved by the 19th ARG Commanding Officer, as these are mandated “quiet hours.”

After 19th ARG departs Robins AFB, the associated buildings will be vacant and noise associated with 19th ARG operations will not occur at Robins AFB. The noise generated

in this area of Robins AFB will be insignificantly less than current noise conditions at Robins AFB.

Proposed Construction Area. No significant noise is currently being generated by operations within this area. Noise is generated from vehicles traveling Beale Drive, but noise heard within this site is primarily generated by aircraft on the flightline. Based on available noise modeling data as presented in the AICUZ, the site is located within an area subject to less than 80 dB DNL.

Ordinance Area. No significant noise is currently being generated from this area. Noise outside of the area is generated by vehicles on adjacent roadways and airfield operations. Based on available noise contour data as presented in the AICUZ, the area along Beale Drive is located within an area subject to less than 85 dB DNL as it is located adjacent to the runway, while the area further east is located within an area subject to less than 75 dB DNL.

3.5 BIOLOGICAL ENVIRONMENT

3.5.1 Flora

Existing Buildings Occupied by 19th ARG Area. Areas around the existing buildings have been disturbed by previous construction activities and contain mostly developed, impervious surfaces. Flora located at the area includes small areas of landscaped grasses and a few landscaped shrubs and trees.

Proposed Construction Area. Areas around the Proposed Construction Area have been disturbed by construction activities and contain mostly developed, impervious surfaces. The Proposed Construction Area contains areas of impervious surface and limited flora that includes landscaped grasses.

Ordinance Area. Areas around the existing buildings have been disturbed by previous construction activities and contain mostly developed, impervious surfaces. Flora located within the area includes areas of landscaped grasses.

3.5.2 Fauna

The Existing Buildings Occupied by 19th ARG Area, Proposed Construction Area and Ordinance Area are located within heavily developed portions of base, and consist mainly of pavement and mowed, grass-covered areas; a few landscaped trees are located around existing buildings, which small mammals and birds could use. The areas offer minimal habitat for fauna.

Bird species that use wetland areas adjacent to the sites are primarily small songbirds, not large species such as ducks and herons. Wintering blackbird flocks are often seen following the tree line along the southern end of the runway (Runway 33) as well as the tree line at the northern end of the runway (Runway 15) and along the forest corridor that borders State Route 247 just north and west of the base. From mid-October to early March, huge numbers of blackbirds roost during the evening hours in the river forest east of base. At sunrise, and again at sunset, these birds fly over the airfield, typically following the forest edge along the northern and southern ends of the airfield as they travel to crop fields in Houston County to feed on waste grain during the day, and back again in the evening when they overfly the airfield as they return to their roost.

The potential for bird/wildlife aircraft strikes poses a considerable hazard to aircraft and their crews. The purpose of the *Robins AFB Bird/Wildlife Aircraft Strike Hazard (BASH) Plan 91-212* (RAFB, 2007) is to provide guidance to minimize or eliminate aircraft exposure to potentially hazardous bird strikes, as well as strikes of terrestrial animals on the runway. The BASH plan is based on hazards from both permanent (non-migratory) bird populations, seasonal (migratory) bird populations, and other animals. Implementation of portions of the plan is continuous, while other portions require implementation as required by increased bird or animal activity in the vicinity of the

runway. The hazards to safe flying posed by birds and animals are so varied that no single solution to the bird strike problem exists.

Annex S to the Robins AFB BASH Plan, Bird Hazard Warning System Operation Bird Watch, outlines procedures for the immediate exchange of information between Robins AFB airfield ground agencies and aircrews concerning the existence and location of birds that could pose a hazard to flight. Bird Watch Conditions (BWCs) are used to identify bird locations with a condition code. For example, during “BWC Severe,” which is the worst-case condition, a heavy concentration of birds (more than 15 large birds or 30 small birds) is on or above the runway/taxiways, in-field areas, and departure or arrival end of the runway. Robins AFB also has two phase periods for BWC, with “Phase I” being the period of the year (March – August) with normal forecast bird activity. “Phase II” is the period of the year (September - February) with increased bird activity and resulting in automatic SEVERE from 30 minutes before to 60 minutes after sunrise and sunset. During the Phase II period, increases in bird activity are typically seen transiting from east of the airfield, along the tree-line, to the west of the airfield crossing the approach and departure ends of the runway. When Phase II conditions are declared, aircraft do not take off or land during the sunrise and sunset periods unless the unit commanders order the flights.

3.5.3 Endangered, Threatened and Sensitive Species

No threatened, endangered or sensitive plant or animal species or their habitats are located on or adjacent to the Existing Buildings Occupied by 19th ARG Area, Proposed Construction Area or Ordnance Area. Nor do activities within these areas significantly adversely affect threatened, endangered or sensitive plant or animal species or their habitats.

3.6 CULTURAL RESOURCES

The archeological and cultural resources of Robins AFB are summarized in the *Integrated Cultural Resources Management Plan* (ICRMP) for Robins AFB that was

finalized December 2005. The base has been completely surveyed for archaeological sites and historic structures/districts, and the survey work has been reviewed and accepted by the Georgia Department of Natural Resources Historic Preservation Division (HPD) / State Historic Preservation Office (SHPO). In 2003, an archaeological evaluation and soil survey mapped areas on the base with intact soil profiles for future archaeological investigations. This report showed that the soil over the entire airfield and many adjacent areas was found to have been significantly disturbed by construction activities that took place between the mid 1940s and early 1960s. All upland Phase II archaeological testing has been completed and Robins AFB has a total of 15 archaeological sites eligible for listing on the National Register of Historic Places (NRHP). The historical/architectural survey of the base examined all structures on base and Robins AFB has a total of 26 buildings eligible for the NRHP.

In addition to the general requirements for any Air Force facility to preserve cultural resources, Robins AFB currently is finalizing a Programmatic Agreement (PA) with the Georgia SHPO regarding maintenance activities on historic structures or in historic districts. Once the PA is finalized and signed, RAFB will be obligated to follow its requirements.

Additional information regarding cultural resources at Robins AFB is presented in **Section 6.0 of Appendix A.**

Existing Buildings Occupied by 19th ARG Area. No archaeological sites have been recorded in the vicinity of this area. Some of this area, as previously described, was reclaimed from wetlands and the surface elevation was raised with fill dirt during the last 1950s prior to construction of the Cold War-era buildings. Building 2067, which is located along Blunk Drive, has been determined to be eligible for listing on the National Register of Historic Places (NRHP). No other NRHP-listed or -eligible structures are located within the view shed of the existing building area.

Proposed Construction Area. No archaeological sites have been recorded in the vicinity of the Proposed Construction Area. No structures listed or potentially eligible for listing on the NHRP are located within the area or in the immediate vicinity.

Ordinance Area. No archaeological sites have been recorded in the vicinity of the Ordinance Area. Building 97, which is located along Ocmulgee Drive and Building 106, which is located along Creek Court, were both constructed in 1960 as Munitions Storage Facilities, and have been determined to be eligible for listing on the NRHP. No other NRHP-listed or -eligible structures are located within the view shed of the Ordinance Area.

3.7 SOCIOECONOMIC ENVIRONMENT

Socioeconomic resources include the basic attributes and resources associated with the human environment. In particular, this includes population and economic activity. Economic activity typically encompasses employment, personal income and industrial growth. Information related to the socioeconomic environment at Robins AFB is presented in **Section 10.0 of Appendix A.**

Existing Buildings Occupied by 19th ARG Area. This area is currently occupied by 19th ARG operations, including administrative offices, maintenance shops and hangars. 19th ARG maintains approximately 550 personnel on base, of which approximately 400 are located within the area included in the Proposed Action.

Approximately 50 19th ARG personnel occupy on-base housing and approximately 50 19th ARG personnel occupy on-base dormitory rooms. The remaining approximately 450 personnel live off-base. Businesses both on-base and off-base benefit from expenditures by local 19th ARG staff.

19th ARG has a \$9.75 million annual budget, including approximately \$1 million for operation and maintenance and \$350,000 for Transportation Working Capital Funds. The

budget also includes the flying hour program, consisting of \$4.1 million for the KC-135R and \$4.3 million for the C-5 programs.

After 19th ARG departs Robins AFB, the positive impact to the local socio-economy will not be realized.

Proposed Construction Area. No operations occur within the Proposed Construction Area, and no employees or expenditures are currently associated with the site.

Ordinance Area. Operations currently located within the Ordinance Area include munitions storage areas, warehouse space and office space. Building 9 contains office space for approximately 23 116th ACW personnel.

Robins AFB Environs. Based on review of U.S. Census Bureau data (U.S. Census Bureau, 2007), Robins AFB has a minority population greater than 35 percent and less than 5 percent of the Robins AFB population is below poverty level. The majority of the area adjacent to Robins AFB has a minority population greater than 40 percent and greater than 25 percent of the population is below poverty level (U.S. Census Bureau, 2007). Houston County has a minority population of approximately 30 percent and approximately 10 percent of Houston County is below poverty level (U.S. Census Bureau, 2007).

3.8 TRANSPORTATION AND SAFETY

At Robins AFB, safety issues are those that directly affect the protection of human life and property, and principally involve aviation, munitions and fire prevention. In addition, Air Force personnel are protected by observing Air Force Occupational Safety and Health (AFOSH) standards and RCRA (see **Section 3.3.3**). Additional information regarding safety at Robins AFB is presented in **Section 9.0 of Appendix A**.

Existing Buildings Occupied by 19th ARG Area. Roadways surrounding the existing buildings include Beale Drive to the south, Borghese Drive on the eastern portion and

Blunk Drive on the western portion of the site. All personnel proceeding to this area must converge onto Beale Drive via Hannah Road or Richard Ray Boulevard. Current trip counts involve one to two roundtrips per day per individual depending on whether the personnel dine on or off base. Trip counts associated with 19th ARG operations in this area of Robins AFB are relatively equal Monday through Friday, with about 400 to 800 roundtrips per day. Less than 30 19th ARG personnel have weekend duty, resulting in about 30 to 60 roundtrips per day. On average approximately 44 deliveries are made to 19th ARG facilities per week.

No sidewalks are present along roads in this area. Parking lots are located around each of the existing buildings and provide ample parking for the approximate 400 19th ARG personnel currently occupying these buildings and flightline area. Current conditions within this area and the surrounding areas result in insignificant adverse traffic safety effects.

19th ARG aircraft flight patterns are conducted in accordance with Robins AFB flight operation and safety procedures.

After 19th ARG departs Robins AFB, the 400 to 800 associated daily roundtrips will not occur and, therefore, traffic levels in the area will be less than at present.

No significant safety issues are associated with 19th ARG operations.

Proposed Construction Area. The Proposed Construction Area is divided by Beale Drive, and a parking lot associated with the adjacent shopette is located within the site. No sidewalks are located in this area. No safety issues are currently associated with the area or the surrounding roadways.

Ordinance Area. The existing buildings are accessed via Beale Drive, Creek Court and Fence Road. All personnel proceeding to this area must converge onto Beale Drive via Hannah Road or Richard Ray Boulevard. No sidewalks are present along these roads. Parking lots are located around each of the existing buildings and provide ample parking

for personnel currently occupying/utilizing these buildings. Current conditions within this area and the surrounding areas result in insignificant traffic safety effects.

The MSA is surrounded by 6-foot chain-linked fence topped with razor wire. 78th Munitions Section personnel and other designated ordnance personnel have access to the area; access by all other personnel is restricted. Personnel in this area follow appropriate DoD, AFOSH and OSHA procedures regarding ordnance safety.

No significant safety issues are associated with the Ordnance Area.

Robins AFB Environs as Related to Current Robins AFB Operations. All aircraft flight operations and patterns associated with Robins AFB are conducted in accordance with Robins AFB flight operation and safety procedures; no collisions have been recorded at Robins AFB.

The Air Force establishes accident potential zones (APZs) based on information of past DoD aircraft accidents. The analysis determined that the areas immediately beyond the runway threshold and along approach and departure flight paths have the most significant potential for aircraft accidents. At Robins AFB, APZs extend 7,000 feet from the runway threshold.

4.0 ENVIRONMENTAL EFFECTS

This chapter describes the potential environmental effects of implementing the Proposed Action and the No-Action Alternative. Potential effects of the Proposed Action are based on the description of the action as presented in **Section 2** and existing environmental conditions of the project areas as presented in **Section 3**. Environmental effects from the No-Action Alternative address effects as they occur in the future after departure of 19th ARG, and without implementation of the Proposed Action.

4.1 PHYSICAL ENVIRONMENT

4.1.1 Topography

4.1.1.1 No-Action Alternative

Under the No-Action Alternative, topography of Robins AFB would remain unchanged because no construction would occur. Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to topography at or near Robins AFB.

4.1.1.2 Proposed Action

Demolition and Renovation of Existing Buildings. No significant positive or significant adverse impacts to topography would result from the proposed demolition and renovation activities. Topography surrounding 19th ARG-occupied buildings and ordnance storage areas would not be impacted.

Construction of New Hangar and Parking Areas. Implementation of the Proposed Action would require minimal alterations to existing topography for construction of the new hangar, parking areas, detention pond and hardstand, and relocation of the atmospheric sensor. Clean fill material would be brought onto an approximately 1.2-acre Ocmulgee River floodplain area for the re-aligned Beale Drive and new parking lot area

to raise the elevation equal with Beale Drive. The necessary construction fill, while its precise source cannot be identified at this time, will come from an existing commercial source fully permitted under applicable laws protecting the environment. Altering of topography of this area would result in an insignificant adverse impact to topography due to the overall small size of this area when compared to the surrounding area. Refer to **Section 4.1.3.2** regarding the proposed filling of the 1.2-acre section of the floodplain.

Marine Corps Operations. No change to, or positive or adverse impacts to topography would result from the operational aspects of the Proposed Action.

4.1.2 Surface Waters

4.1.2.1 No-Action Alternative

Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to surface waters near Robins AFB because no construction would occur. Surface waters would remain unchanged and surface waters are not currently being significantly impacted by the subject areas or operations.

4.1.2.2 Proposed Action

Demolition and Renovation of Existing Buildings. No significant positive or significant adverse impacts to surface waters associated with and located near buildings that would be demolished or renovated would result from implementation of the Proposed Action. This is because the Proposed Action includes implementation of BMPs designed to protect surface waters, and no surface waters are located on or directly adjacent to these areas. See **Section 4.1.4.2** for potential impacts to surface waters from soil erosion and storm water runoff, and additional BMP information.

Construction of New Hangar and Parking Areas. No significant positive or significant adverse impacts to surface waters associated with and located near the Proposed Construction Area would result from implementation of the Proposed Action because the

Proposed Action includes implementation of BMPs designed to protect surface waters. Increased impervious surface in the area would generate a greater amount of storm water runoff that would be controlled by BMPs and thus result in insignificant adverse impacts to down-gradient surface waters. See **Section 4.1.4.2** for potential impacts to surface waters from soil erosion and storm water runoff, and additional BMP information.

Marine Corps Operations. No significant positive or significant adverse impacts to surface waters would occur as a result of proposed Marine Corps operations at Robins AFB because the Proposed Action includes implementation of BMPs designed to protect surface waters. See **Section 4.1.4.2** for potential impacts to surface waters from storm water runoff and additional BMP information.

4.1.3 Floodplains and Wetlands

4.1.3.1 No-Action Alternative

Under the No-Action Alternative, floodplain characteristics would remain unchanged and wetlands would not be impacted. Implementation of the No-Action Alternative would cause neither significant positive nor significant negative effects to floodplain characteristics and wetlands near Robins AFB.

4.1.3.2 Proposed Action

Demolition and Renovation of Existing Buildings. Implementation of demolition and renovation activities associated with the Proposed Action would result in neither significant positive nor significant negative effects to floodplains or wetlands. No changes to the 100-year floodplain or to existing wetland areas or receiving storm water runoff from the area would occur under the Proposed Action, and these resources are not currently significantly impacted by operations in the area.

Construction of New Hangar and Parking Areas. Construction of the new hangar would result in neither significant positive nor significant negative effects to wetlands nor

the 100-year floodplain. Existing wetland areas would not be affected. Construction of the new parking area south of the new hangar, the associated realignment of Beale Drive, and relocation of the atmospheric sensor would, however occur within the 100-year floodplain and directly adjacent to wetland areas. The Proposed Action includes implementation of BMPs during construction and design features that would protect wetlands, and no significant adverse or positive effects to wetlands would occur. Construction for this parking lot, road realignment and relocated sensor installation would not occur within the State of Georgia BMP-specified buffer zone of 25 feet. In addition, any existing vegetative buffer would be allowed to remain in place between the areas of construction and the wetland.

Prior to performing construction projects within a floodplain, the Air Force must investigate and exhaust all potential alternatives that would avoid working within floodplain resources. This requirement is consistent with Executive Order (EO) 11988, Floodplain Management, and the wetlands/floodplains compliance responsibilities of the Air Force per AFI 32-7061. EO 11988 addresses floodplain management and requires that the functions of floodplains be considered in the decision-making process. Adverse impacts to floodplains may be acceptable only if there is no practicable alternative. Alternates evaluated for realignment of Beale Drive and the adjacent parking lot are not practicable. Alternative sites for realignment of Beale Drive are directly related to alternative hangar sites, as the Proposed Hangar Site requires realignment of Beale Drive to meet Security Forces anti-terrorism/force protection requirements between buildings and roads. An alternative hangar site that was considered is the area between Building 2065 and fuel pumps to the north; this site potentially contains contaminated soils. Due to time constraints for award of the design/build contract in FY 07, a non-contaminated site was necessary for the proposed hangar and this site was eliminated from further evaluation. A second alternative hangar site that was considered is on the northern side of the fuel pumps; a hangar at this site would have interfered with 116th ACW operations and would have been distant from other Marine Corps facilities. Since alternative sites considered for the new hangar were not practicable, the selected hangar site was pursued and the best location for the hangar parking lot, which should be located near the new

hangar it supports, was chosen. Existing parking lots near the proposed hangar site are full and no other location for the new parking lot was identified within a reasonable distance from the proposed hangar. Therefore, the proposed new hangar and new parking lot would be located within the 100-year floodplain.

The new sensor would occupy an area approximately 8 feet by 8 feet, and be located at an approximate 252 ft NGVD elevation, within the 100-year floodplain. It would be removed from a nearby location at an elevation of approximately 255 ft NGVD and also in the 100-year floodplain. Alternative sites for relocation of the atmospheric sensor are also impracticable. Required siting of the atmospheric sensor is directly related to its proximity to the Fire Station (Building 2086) and its isolation from other structures and accessible areas. Other sites that were preliminarily evaluated did not meet the functional and siting requirements for the atmospheric sensor.

Due to the lack of practicable alternatives that meet the selection criteria, a portion of the Proposed Action would occur within the floodplain. 78 CEG/CEV has prepared a Finding of No Practicable Alternative (FONPA) to explain why there is no practical alternative to construction in a floodplain.

Storage capacity of Horse Creek and the downstream Ocmulgee River floodplain is important for storing surface water during periods of heavy rainfall. During the passage of a flood through Horse Creek and the Ocmulgee River floodplain, the water level rises, and water spreads into floodplain areas, reaches a maximum and then recedes. The flow rate to downstream areas is dependent upon the amount of storage volume in the floodplain, with the water elevation, river flow rate and storage volume all being interdependent.

The floodplain storage loss in Horse Creek and Ocmulgee River floodplain would be insignificant considering the proposed plan to realign portions of Beale Drive, construct a new parking lot and relocate the atmospheric sensor within the 100-year floodplain. The parking lot, realigned Beale Drive, and atmospheric sensor would not be inundated during a 100-year flood, as they would be raised above the 100-year floodplain elevation.

The proposed parking lot and atmospheric sensor site are located in the backwater area of Ocmulgee River, more than 4,500 feet from the nearest waterway. Placing fill in this area and using it as a parking area or for placement of the atmospheric sensor would result in no significant impact on the overall conveyance of the river as the backwater area of the Ocmulgee River contains a significant floodwater storage capacity to sufficiently handle the displaced floodwaters. Based on this evaluation, the Proposed Action would have minimal to no effect on floodplains or floodplain characteristics.

Marine Corps Operations. Future operations associated with implementation of the Proposed Action would result in neither significant positive nor significant negative effects to floodplains or wetlands. No changes to the 100-year floodplain or to existing wetland areas or receiving storm water runoff from the area would occur as a result of operations, as BMPs employed as part of the Proposed Action would protect these resources.

4.1.4 Storm Water

4.1.4.1 No-Action Alternative

Implementation of the No-Action Alternative would cause neither significant positive nor significant negative effects to storm water near Robins AFB because no changes to storm water or the storm water conveyance system would occur, and storm water is not currently being significantly impacted by the areas.

4.1.4.2 Proposed Action

Demolition and Renovation of Existing Buildings. Demolition and renovation activities associated with the Proposed Action would cause neither significant positive nor significant negative effects to storm water near Robins AFB because no changes to storm water or significant changes to the storm water conveyance system would occur and storm water is not currently being significantly impacted by operations in the area.

Construction of New Hangar and Parking Areas. Construction activities associated with the Proposed Action would not significantly adversely impact storm water in the area. However, impervious area would increase as a result of the Proposed Action, as the area would be partially covered by buildings or pavement. The new hangar, associated hardstand areas, a lined fire system detention pond and area for realignment of Beale Drive would occupy approximately 1.6 acres of surface area and would be supported by an additional approximate 1.2 acres of new parking areas. The atmospheric sensor, its concrete base and security fence would occupy an area approximate 56-square foot area, with a narrow conduit trench extending from the sensor to the Fire Station (Building 2086). The total area of disturbance would be larger (about 144 square feet) considering construction required for the concrete base, plus the area of ground disturbed by the excavation for the conduit connection.

In addition to meeting applicable building codes for the construction of the hangar, the building contractor will be required to satisfy the following environmental requirements, submittals and permits related to the proposed project. The permit process includes submission of Notice of Intent for permit coverage under National Pollutant Discharge Elimination System (NPDES) General Permit GAR100001 to discharge storm water associated with construction activity; development and approval of an Erosion, Sediment, and Pollution Control Plan that meets requirements of the Permit, while written in accordance with Georgia Soil and Water Conservation Commission's *Manual for Sediment and Erosion Control in Georgia, 5th Edition*; following of applicable county water protection ordinance; obtaining a Houston County Sediment and Erosion Control Permit; submittal of land disturbance fees to EPD and Houston County; obtaining of a dig permit from 78th CEG to identify underground utilities; implementation of BMPs; and submission of a Notice of Termination to Georgia Environmental Protection Division (EPD) following completion of work when site conditions meet the definition of "final stabilization." Permit requirements also include performing periodic site inspections, sampling storm water discharges from the construction site, and analyzing turbidity of storm water runoff, performed in accordance with 40 CFR 136.

All permit applications would be submitted to 78th CEG/CEV for review prior to final submittal to governing authorities.

Marine Corps Operations. The design of the new hangar and parking area would incorporate necessary pollution-prevention elements for proposed outdoor storage areas. Also, BMPs would be implemented to reduce the potential for releases of contaminants from these areas that could adversely impact storm water. BMPs would be implemented as necessary to control inadvertent releases of equipment liquids (lubricants, etc.) and for clean-up before they could adversely affect storm water. Hence, implementation of the Proposed Action would result in neither significant adverse nor significant positive impacts to storm water related to the hangar operations.

4.1.5 Geology and Soils

4.1.5.1 No-Action Alternative

No changes to geology or soils at any of the subject areas of Robins AFB would occur under the No-Action Alternative because no construction or renovation would occur. Conducting no action would produce neither significant positive nor significant negative effects.

4.1.5.2 Proposed Action

Demolition and Renovation of Existing Buildings. Demolition and renovation activities associated with the Proposed Action would result in no changes to geology or soils as demolition and renovations would not include deep excavation or other activities that could adversely affect geology or soils in the area.

Construction of New Hangar and Parking Areas. Geology would not be affected as a result of construction activities, as construction activities would not be deep enough to affect geologic resources. Existing surface soils would be covered with approximately 5,000 cubic yards of fill soils to bring the area above the base flood elevation and meet

current site development plans; as previously discussed, the necessary construction fill, while its precise source cannot be identified at this time, will come from an existing commercial source fully permitted under applicable laws protecting the environment.. Placement of fill would not adversely affect geology or soils in the area. As discussed previously in **Section 4.1.4.2**, as a result of construction and demolition (pavement removal) and placement of fill associated with the Proposed Action, the potential for soil erosion and the potential for eroded soil to adversely affect the quality of storm water runoff would increase. BMPs per the *Manual for Sediment and Erosion Control in Georgia* will be employed, and the impacts of the action would be insignificant.

Marine Corps Operations. Future Marine Corps operations at Robins AFB would result in neither significant positive nor significant negative effects to the geology or soils at Robins AFB.

4.1.6 Groundwater

4.1.6.1 No-Action Alternative

Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to groundwater because no changes to groundwater resources would occur and groundwater is not currently being significantly impacted by the subject area conditions and operations.

4.1.6.2 Proposed Action

Demolition and Renovation of Existing Buildings. Renovation activities associated with the Proposed Action would not impact groundwater because no ground-penetrating work would occur, and the activities would produce neither significant positive nor significant negative effects to groundwater. Nor would demolition activities impact groundwater because excavation and removal of Building 2069's footings and/or slab would not penetrate deep enough to intersect groundwater; associated activities would produce neither significant positive nor significant negative effects to groundwater.

Construction of New Hangar and Parking Areas. Excavation associated with the hangar construction and installation of utilities is not expected to intersect groundwater. Piling installation for the new hangar would intersect groundwater. If excavation and other construction activities were to require dewatering, BMPs will be implemented as part of the Proposed Action and impacts would be insignificant. Hence, conducting the Proposed Action at the Proposed Construction Area would produce neither significant positive nor significant negative effects to groundwater.

Marine Corps Operations. Future Marine Corps operations associated with the Proposed Action would not impact groundwater at Robins AFB and would produce neither significant positive nor significant negative effects to groundwater.

4.1.7 Water Supply and Drinking Water

4.1.7.1 No-Action Alternative

Insignificant positive impacts to existing water supply and drinking water resources and usage would occur under the No-Action Alternative; no negative impacts would occur and insignificant positive impacts would occur. Marine Corps units would not relocate to Robins AFB, the existing 19th ARG-occupied buildings would remain vacant until occupied by other users, and potable water to these buildings would not be consumed; water usage at Robins AFB would be reduced when compared to current levels. Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to water supply and drinking water.

4.1.7.2 Proposed Action

Implementation of the Proposed Action would not affect the existing water supply at Robins AFB to a significant degree and overall drinking water consumption at Robins AFB would not increase as a result of the Proposed Action.

Demolition and Renovation of Existing Buildings. Limited amounts of potable water would be used during demolition and renovation activities. The amount required would be insignificant when compared to availability of potable water at Robins AFB. The restrooms in Building 2069 would be replaced with new facilities in Building 2066.

Construction of New Hangar and Parking Areas. Existing water pipes located beneath the proposed Hangar construction area would be relocated as part of the Proposed Action. Existing pipes would be used until new pipes were installed; service would be interrupted for an insignificant time period and could occur over a weekend to further minimize disruption to customers.

Limited amounts of water would also be used for curing of concrete and other related construction activities. The amount required would be insignificant when compared to availability of potable water at Robins AFB.

Marine Corps Operations. Potable water associated with the buildings to be occupied by Marine Corps operations would not be consumed for the approximate 2-year period between 19th ARG's departure and move-in of the Marine Corps. Based on a comparison of the number of personnel and the similarity of operations between 19th ARG and Marine Corps units, less water would be consumed by the Marine Corps than currently by 19th ARG in this area of Robins AFB and at Robins AFB as a whole. Refer to **Appendix C** for water consumption and wastewater generation calculations.

Potable water would be used at the new hangar. The amount of water used at the new hangar would be more than is currently used within this area. However, the increased amount would not result in a significant negative effect on water supply and drinking water at Robins AFB since the amount of water used by Marine Corps personnel and operations would be less than the amount currently used by 19th ARG. Approximately 550 19th ARG personnel will vacate Robins AFB in 2008, while only 200 to 300 Marine Corps personnel would be added to the base on a daily basis, and 600 Marine Corps personnel would be added for two days once a month. In an average month, this equates to approximately 12,100 "person days" of water consumption for 19th ARG, and

approximately 5,600 to 7,800 “person days” of water consumption for the Marine Corps. Furthermore, existing 19th ARG operations compared to the proposed Marine Corps operations and the existing and expected water consumption for operations are very similar.

The new hangar would maintain two water storage tanks storing approximately 250,000 gallons to meet the demand required for a fire protection system. The entire amount of water would only be used during fire events. Annual testing of the fire protection system would consume approximately 200 gallons, while 5-year testing would consume approximately 50,000 gallons.

Existing potable water would be used at the Ordnance Area. The amount of water used at the Ordnance Area would be equivalent to current use at the area; therefore, neither significant positive nor significant negative effects on the water supply and drinking water would occur.

4.2 AIR QUALITY

Potential air emissions resulting from the Proposed Action and No-Action Alternative have been evaluated based on the Clean Air Act as amended. The effects of an action are considered significant if they increase ambient air pollution concentrations above NAAQS, contribute to an existing violation of NAAQS, or interfere with or delay the attainment of NAAQS.

4.2.1 No-Action Alternative

No changes to air emissions would occur under the No-Action Alternative. Marine Corps units would not relocate to Robins AFB, the existing 19th ARG-occupied buildings would remain vacant until occupied by other users, and no new air emissions would be generated. Implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to air emissions.

4.2.2 Proposed Action

Demolition and Renovation of Existing Buildings, and Construction of New Hangar and Parking Areas.

Demolition, renovation and construction activities in preparation of the Marine Corps' relocation to Robins AFB would increase emissions of CO, hydrocarbons and NOx from construction employee traffic and operation of heavy equipment. The increase in trips and emissions from construction worker vehicles would be temporary and insignificant.

Fugitive dust could be released during the demolition, renovation and construction, and demolition activities associated with pavement removal. BMPs as outlined in the Erosion, Sediment, and Pollution Control Plan would include procedures for wetting disturbed portions of the project areas during periods of excessive dryness, and limit the emissions to an insignificant amount.

Additional sampling would be performed to adequately assess all toxic building materials that would be disturbed during the demolition and renovation. Demolition plans would be prepared and implemented to provide for safe removal and disposal of all identified ACM and LBP materials and in accordance with governing regulations. ACM would be wetted to prevent the release of airborne particles, and personal protection and negative air containment used as appropriate.

Marine Corps Operations. Mobile air emissions associated with the 19th ARG would not occur at Robins AFB once the 19th ARG vacates the base in 2008. Mobile air emissions would increase once the Marine Corps operations commenced in 2010. However, since the number of Marine Corps personnel would be less than the number of 19th ARG personnel on a monthly basis, the amount of air emissions from employee vehicles would be less than those at present. The Marine Corps personnel would generate approximately 7,800 trips per month, based on one roundtrip per person per day (see **Appendix C**), 1,000 fewer trips per month as compared to the 19th ARG's approximately 8,800 round trips per month. When the vacated facilities are re-occupied, an insignificant net increase in vehicle traffic for the area could occur.

The Marine Corps would relocate 18 helicopters to Robins AFB, and helicopter flight operations would occur Monday through Friday between the hours of 0700 and 2200 with approximately 8 sorties completed per day. The number of weekly flight sorties would increase (from 780 19th ARG aircraft sorties per year versus 2,368 Marine Corps helicopter sorties per year). Flight operations would also occur on 2 drill weekend days per month during the same hours, with approximately 12 sorties completed per day.

The emission factors associated with Marine Corps helicopters (**Table 4-1**) are less than 19th ARG aircraft (see **Table 3-1** in **Section 3.2.2**). Based on the estimated increased number of sorties to be conducted by the Proposed Action and decreased emission factors associated with helicopters as compared to 19th ARG aircraft, the amount of PM, CO, NO_x and SO_x emissions would be significantly less than the current 19th ARG emissions. VOC emissions would, however, increase by 1.63 tons as a result of the Proposed Action but not result in any violations of the NAAQS because Houston County is in attainment for VOCs and the increase in VOC emissions is not large enough when compared to facility-wide total VOCs in Robins AFB's 2006 Air Emissions Inventory (196.8 tons) to trigger non-attainment status. Refer to **Table 4-1. Appendix C** contains the air emission calculations.

Table 4-1. Predicted Marine Corps Helicopter Annual Air Emissions*

Air Contaminant	PM10 (tons/year)	PM2.5 (tons/year)	CO (tons/year)	NO_x (tons/year)	SO_x (tons/year)	VOC (tons/year)
H-1 Helicopters	-	-	3.07	0.70	0.07	2.95

* Air emissions were calculated using emission factors documented in AF IERA, 2002.

Air emissions would also be generated by ground support equipment (GSE) operations; these emissions would be comparable to existing 19th ARG AGE operations and emissions.

Air emissions would be generated from the helicopter maintenance activities performed by the Marine Corps units. These maintenance activities would include minor painting activities (touch up painting with aerosol cans) in an 8-foot by 10-foot paint booth, hand-

wipe cleaning operations and other routine minor maintenance activities. These emissions would be comparable to existing 19th ARG operations and emissions.

Current plans for construction of the new Helicopter Maintenance Hangar facility include the use of a natural gas-fired hot water boiler system rated at 1 million British Thermal Unit (BTU) per hour (mm BTU/hr). No significant air emissions would be generated from the operation of the building heating systems.

Robins AFB is considered a “major” source as defined by the Clean Air Act Regulations. Therefore, the Marine Corps units will comply with all applicable standards at Robins AFB including the Aerospace NESHAP, Reciprocating Internal Combustion Engine NESHAP, and Halogenated Solvent NESHAP provisions. All painting, handwipe cleaning activities and generators will use compliant materials and conform to recommended regulatory guidelines.

Based on the above-described assessment, implementation of the Proposed Action would not cause any violations of the NAAQS. Implementation of the Proposed Action would not significantly increase air emissions at or near the Existing Buildings Occupied by the 19th ARG Area.

4.3 WASTE MANAGEMENT AND TOXIC MATERIALS

4.3.1 Wastewater

4.3.1.1 No-Action Alternative

Under the No-Action Alternative, sanitary and industrial wastewater generation would decrease at the Proposed Action areas, as the Marine Corps units would not relocate to Robins AFB, wastewater would not be generated, and the existing 19th ARG-occupied buildings would remain vacant until occupied by other users. Thus, implementation of the No-Action Alternative would not result in significant adverse or significant positive impacts to the environment as it relates to wastewater.

4.3.1.2 Proposed Action

Demolition and Renovation of Existing Buildings, and Construction of New Hangar and Parking Areas. Demolition, renovation and construction activities would not generate significant amounts of sanitary or industrial wastewater. Existing buildings in the area would remain except for Building 2069, and the new restrooms in Building 2066 and new hangar would be connected to the existing sanitary and industrial sewer systems. Some of the existing sanitary sewer lines located in the area would be relocated during construction. BMPs would be employed during the relocation and connection activities and any impacts to the systems would be insignificant.

Renovation and construction activities associated with the Proposed Action would produce neither significant positive nor significant negative effects to sanitary and industrial wastewater generation at Robins AFB.

Marine Corps Operations. Wastewater generation from the Marine Corps facilities would be less than wastewater generated by existing 19th ARG operations. The approximately 200 to 300 Marine Corps personnel that would occupy this area Monday through Friday and the approximate 600 personnel that would occupy the area on drill weekends once a month would result in an overall decrease of sanitary wastewater volume of approximately 24 percent from this area over a year's time. Refer to **Appendix C** for wastewater generation calculations.

The types of industrial wastewater generated at the proposed Marine Corps facilities also would be similar to those generated by existing 19th ARG operations. Aircraft washing would generate industrial wastewater that would be captured by trench drains installed in the hangar to direct wash water to the industrial waste line that discharges to IWTP No. 1 during normal facility operations. Aircraft would be washed biweekly and typically take one hour. Assuming the Marine Corps personnel would run a standard 30 gallon per minute (gpm) hose at full flow for the duration of the hour-long wash, a maximum of approximately 32,400 gallons of wastewater would be generated biweekly for all aircraft

washing. IWTP No. 1 has capacity to handle this increase in wastewater, and thus result in insignificant adverse impacts to wastewater at Robins AFB.

Furthermore, BMPs implemented in the aircraft washing area would reduce the potential for spills and drips to enter the trench drains, and result in insignificant adverse impacts to the wastewater system at Robins AFB.

Additional wastewater would be generated during fire system testing. Approximately 200 gallons of wastewater would be generated during each annual testing event and approximately 50,000 gallons of wastewater would be generated during each five-year testing event. Also, approximately 250,000 gallons of wastewater could be discharged during a fire event. The fire system is designed for zero discharge. The wastewater would be directed to the trench drains and routed to a lined fire system detention pond for evaporation of these wastewaters, and no wastewaters would enter the industrial or sanitary wastewater systems.

Based on the above evaluation, Marine Corps operations would produce neither significant positive nor significant negative effects to sanitary and industrial wastewater generation at Robins AFB.

4.3.2 Solid Waste

4.3.2.1 No-Action Alternative

No significant adverse or significant positive impacts would occur to solid waste and the physical environment as it relates to solid waste because no change in the volume or handling of solid waste would occur at Robins AFB, and existing solid waste handling and disposal does not significantly impact the physical environment. Marine Corps units would not relocate to Robins AFB and the existing 19 ARG-occupied buildings would remain vacant until they are occupied by other users. The amount of solid waste generated would temporarily decrease until the vacated facilities were reoccupied.

4.3.2.2 Proposed Action

Implementation of the Proposed Action would result in no significant positive or significant negative impacts to solid waste or to the physical environment as it relates to solid waste. Adequate space is available in the Houston County landfill for the solid waste that would be generated from this project.

Demolition and Renovation of Existing Buildings, and Construction of New Hangar and Parking Areas. Conducting the Proposed Action would temporarily increase the generation of solid waste from demolition, renovation and construction activities. Waste materials would be separated for reuse and recycling to the extent possible. Waste that is not recyclable would be disposed of by the building contractor in approved local landfill facilities.

Marine Corps Operations. When the vacated facilities are re-occupied, an insignificant net increase in solid waste generation for Robins AFB would occur on a long-term basis. The solid waste would include office waste, paper, plastics, metal and glass containers and standard housekeeping materials, and would be handled in accordance with Robins AFB's ISWMP. The waste would be generated by the 200 to 300 daily Marine Corps personnel and up to 600 Marine Reserves personnel during one weekend a month, which is less than the number of 19th ARG personnel on a monthly basis. The types of solid waste are expected to be similar in nature to that currently generated by the 19th ARG. Office wastes would be recycled to the extent possible and would not cause significant environmental effects. Additionally, the Marine Corps units would recycle batteries, used tires, cardboard and scrap metal to the extent possible.

4.3.3 Hazardous Materials and Waste

4.3.3.1 No-Action Alternative

Under the No-Action Alternative, use of hazardous materials and generation of hazardous waste would decrease, as the Marine Corps units would not relocate to Robins AFB and

the existing 19 ARG-occupied buildings would remain vacant until they are occupied by other users. The No-Action Alternative would cause neither significant positive nor significant negative environmental effects related to hazardous materials and hazardous waste.

4.3.3.2 Proposed Action

Implementation of the Proposed Action would cause neither significant positive nor significant negative environmental effects related to hazardous materials nor hazardous waste.

Demolition and Renovation of Existing Buildings, and Construction of New Hangar and Parking Areas. Hazardous materials, such as fuels for construction equipment and vehicles, would be used during the demolition, renovation and construction activities. These materials would be used and handled in accordance with Robins AFB's HWMP and all applicable regulations, and significant adverse impacts would not occur due to their usage. Renovation of existing buildings and construction of the new hangar and parking areas would not generate hazardous waste.

Marine Corps Operations. Hazardous materials would be maintained in the maintenance shops and hangars similar to those used by current 19th ARG operations. Hazardous material storage lockers would be located outside of Buildings 2065 and 2066. These materials would include diesel for emergency generators, oils, hydraulic fluids, lubes, corrosives and solvents. Hazardous materials stored in the new hangar on a long-term basis would include diesel for the back-up fire pump, oils, hydraulic fluids, lubes, corrosives, solvents, paints and associated painting materials. Fuel for the Marine Corps helicopters would be stored in base storage tanks located in the vicinity of the apron, and delivered to the aircraft on the apron for fueling by tanker vehicles; this procedure is similar to that currently being followed for the 19th ARG KC-135R aircraft. All hazardous materials would be used and handled in accordance with Robins AFB's HWMP and all applicable regulations, and significant adverse impacts would not occur

due to their usage. Hazardous materials would not be used by the Marine Corps in the Ordnance Area.

Hazardous waste would be generated on a long-term basis from Marine Corps operations. Waste streams would include rags and petroleum products, such as hydraulic fluid mixed with used oil and hydraulic fluid mixed with solvent. Approximately sixty 55-gallon drums (3,300 gallons) of hydraulic fluid mixed with used oil and approximately twenty-four 55-gallon drums (1,320 gallons) of hydraulic fluid mixed with solvent would be generated on an annual basis. Waste streams at the new hangar would include rags, adhesives, dried paint and paint thinner. Approximately 6 pounds of adhesives, dried paint and paint thinner would be generated annually. These anticipated generation amounts are based on existing Marine Corps operations and generation volumes at NAS Atlanta. All hazardous waste generated by the Marine Corps will be managed and disposed of pursuant to the requirement of Section 262 of the Georgia Rules for Hazardous Waste Management and in accordance with the Robins AFB Hazardous Waste Facility Permit; shipped off-site under the Robins AFB EPA identification number; and count toward Robins AFB's monthly generation quantity.

The hangar would also maintain a fire protection system consisting of use of Aqueous Film-Forming Foam (AFFF), a hazardous material.

4.3.4 Toxic Materials

4.3.4.1 No-Action Alternative

The No-Action Alternative would cause neither significant positive nor significant negative environmental effects related to toxics and toxic waste because toxic materials would not be affected, and these materials are not currently significantly impacting the environment.

4.3.4.2 Proposed Action

Implementation of the Proposed Action would not significantly adversely or significantly positively impact toxic materials or toxic waste or the environment as it relates to these materials because the materials and waste would be managed and disposed of per applicable regulations, and disposal is a permitted activity. No toxic (radioactive or other) materials would be generated by relocation of the atmospheric sensor.

Demolition and Renovation of Existing Buildings. Additional sampling would be performed to adequately assess all building materials that would be disturbed during the demolition and renovation activities. Where demolition or renovation activities would disturb ACM or LBP materials, plans would be developed and implemented to provide for safe removal and disposal of identified ACM and LBP materials in accordance with applicable regulations. ACM would be wetted to prevent the release of airborne particles. Personal protective equipment, including respirators and protective suits, would be used as necessary by site workers to address asbestos or LBP health issues. Where ACM or LBP materials would remain undisturbed by the renovation activities, they would be maintained in accordance with approved Operations and Maintenance (O&M) Plans as necessary. Removal of ACM and LBP, and maintenance of ACM and LBP under an O&M Plan would be positive impacts of the Proposed Action.

No known PCBs or PCB-containing equipment would be disturbed by demolition or renovation activities. If potential PCB-containing fluorescent light ballasts are located within the buildings to be demolished or renovated, they would be assessed for PCB content prior to removal and disposed of per applicable regulations.

Construction of New Hangar and Parking Areas. Construction of the new hangar and parking areas would not impact ACM, LBP or PCB-containing equipment. All construction materials would be ACM- and LBP-free, and all new equipment installed at the facility would be non-PCB-containing.

Marine Corps Operations. Marine Corps operations would not impact ACM, LBP or PCB-containing equipment. ACM or LBP remaining in the buildings after renovation would be maintained in accordance with approved O&M Plans.

4.4 NOISE ENVIRONMENT

4.4.1 No-Action Alternative

The existing noise environment is not currently significantly impacted by the subject areas or their operations. The noise generated at Robins AFB after 19th ARG's departure would be less than at present. However, flights by the 19th ARG make up an insignificant (less than 5 percent) portion of the total Robins AFB flights. Therefore, implementation of the No-Action Alternative would result in insignificant positive effects to the noise environment because the noise environment at Robins AFB after 19th ARG's departure would not change.

4.4.2 Proposed Action

Demolition and Renovation of Existing Buildings, and Construction of New Hangar and Parking Areas. Demolition and renovation activities would not result in significant adverse impacts to the noise environment because the majority of the activities would be conducted inside the facilities and would be short-term. Nor would reconstruction and new construction activities result in significant adverse impacts to the noise environment because these activities would be short-term, localized and sufficiently distanced from the nearest sensitive receptor elements.

Marine Corps Operations. Noise from Marine Corps operations in the buildings currently occupied by the 19th ARG would be generally consistent with existing noise from these buildings. The current operations do not significantly impact the environment. Noise from future operations in the new hangar would be generally consistent with noise from existing and surrounding operations. The majority of noise associated with the 19th ARG relates to KC-135R aircraft taxiing, take-off and landing operations, with an

average decibel level of 99 dB (Boeing, 2007). The Proposed Action includes operation of H-1 helicopters, at an average decibel level of approximately 105 dB (U.S. Army, 2007). The types of noise generated by KC-135R and H-1 helicopters vary in frequency, with fixed-wing aircraft-generated noise containing almost all frequency components at similar intensities (YMEC, 2007), and helicopters-produced noise having narrow-band high-intensity peaks relating to the rotational speed and movement (Answers.com, 2007). While noise generated by the existing 19th ARG KC-135R aircraft is continuous and similar in amplitude (decibels) and frequency to the other types of aircraft-generated noise at Robins AFB, the noise generated by the Marine Corps helicopters would differ, as they generate a pulsating noise. Additional relevant information regarding aircraft noise is presented in **Appendix D**.

In order to compare the noise levels generated by an aircraft operated by the 19th ARG (KC-135R) to a helicopter (H-1) operated under the Proposed Action by the Marine Corps at Robins AFB, a noise evaluation was performed. The DoD-developed noise model “NOISEMAP” for conducting noise evaluations of aircraft noise levels around military bases was used in this evaluation. NOISEMAP contains a large database of measured military aircraft noise data, as well as portions of the civilian aircraft database used by the Federal Aviation Administration’s (FAA) Integrated Noise Model (INM).

Included in the NOISEMAP program are two subroutines that prepare noise data for input into the model from the noise curve database. These programs, Omega 10 for flyover and Omega 11 ground run-up, can also be used as stand-alone programs to obtain single-event noise measurements at distances from 200 feet to 25,000 feet (Updated Computer Programs for Predicting Single Event Aircraft Noise Data for Specific Engine, Power, and Meteorological Conditions, AL/OE-TR-1994-0008, April 1993). The Omega 10 program provides an output of four noise metrics; Sound Exposure Level (SEL), Effective Perceived Noise Level (EPNL), A-Weighted Sound Level (ALM), and Tone Corrected Perceived Noise Level (PNLT) (refer to **Section 1.1** of **Appendix D** for descriptions of these terms). **Table 4-2** provides the Omega 10 output of the KC-135R, at Max Rated Thrust and 160 knots, and the H-1 series UH-1N, at 100 percent RPM and 80 knots at a distance of 500 feet.

Table 4-2. Omega 10 Modeling of the KC-135 and H-1 Series UH-1N

Distance	Aircraft	Sound Exposure Level (SEL) (dB)		Effective Perceived Noise Level (EPNL) (dB)		A-Weighted Sound Level (ALM) (dBA)		Tone Corrective Perceived Noise Level (PNLT) (dB)	
		A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
500 feet	KC-135R at Max Rated Thrust and 160 knots	100	95.5	103.4	100.5	93.9	89.5	106.4	103.4
	UH-1N at 100 percent RPM and 80 knots	96	89.58	100.5	95.3	82.8	76.3	96.8	91.7

A-G = air to ground, G-G = ground to ground

dB = decibel; dBA = A-weighted decibel

Data extrapolated from tables in Appendix D

The modeling results show that the Marine Corps helicopters generate similar decibel and A-weighted decibel levels to the existing 19th ARG KC-135R aircraft; therefore, a significant adverse impact to noise is not expected.

As previously stated, the Proposed Action would result in Marine Corps helicopter flight operations occurring Monday through Friday between the hours of 0700 and 2200, with approximately 8 sorties completed per day, or 2,080 helicopter sorties per year that occur Monday through Friday. Occasionally, aircraft would return from cross-country flights after normal working hours, while the airfield is open. Flight operations would also occur on drill weekends during the same hours with approximately 12 sorties completed per day, or 288 weekend sorties per year. The Proposed Action includes more individual flights than current 19th ARG operations, resulting in an increase in the number of noise events and an incremental increase in total noise. However, the addition of Marine Corps helicopter sorties at Robins AFB would result in approximately 1,300 more flight operations per year than at present, which is an insignificant net increase of 4.5 percent. Furthermore, the Marine Corps helicopter flight patterns will incorporate noise abatement procedures to limit noise impacts. For example, the Marine Corps' helicopter flight pattern at NAS Atlanta currently operates at a minimum of 1,000 feet AGL outside of the airfield boundaries to limit noise in surrounding populated areas. Similarly, the Marine

Corps helicopter flight patterns at Robins AFB would incorporate measures to strive to avoid low-altitude flying over noise sensitive areas.

The Marine Corps helicopter flight patterns at Robins AFB would be mainly oriented to the east of the runway, and flying over residential and populated areas would be infrequent. When a fixed-wing aircraft is already in the flight pattern, the helicopter flight pattern would be modified and the helicopters would approach from the west. The western pattern would be rarely used due to the Marine Corps standard operating procedures to strive to avoid over-flying built-up areas and/or personnel as much as is operationally possible, and the helicopters would then operate at 1,000 feet AGL or above. The flight patterns would also be in accordance with the Robins AFB flight operation procedures. Marine Corps helicopters would fly a modified pattern that would not conflict with the existing, large fixed-wing aircraft traffic and minimize impacts to noise sensitive areas. Flight patterns at Robins AFB have been established to: strive to avoid heavily populated areas; concur with Air Force criteria regarding speed, rate of climb, and turning radius for each aircraft type; minimize noise levels, especially night levels; and minimize conflict with civilian aircraft. Engine run-up locations have been established in areas that minimize noise levels for the base population as well as the surrounding community. To further help minimize noise levels, normal base operations avoid late-night engine run-ups or departures.

As stated in **Section 2.3.2**, the majority of the Marine Corps helicopter training flights would occur at Robins AFB, and typical daily training flights would involve out-and-back flights lasting approximately 2 hours. The occasional flight patterns associated with overnight flights to Chattanooga, Tennessee, Tallahassee, Florida and Jacksonville, Florida/St. Simons, Georgia would be modified to strive to avoid large fixed-wing aircraft traffic and noise-sensitive areas. Furthermore, the Marine Corps currently fly to these same areas from NAS Atlanta, so no increase in noise levels would result at or in the vicinity of these areas due to the relocation of the Marine Corps units to Robins AFB.

Noise from future Marine Corps operations in the Ordnance Area would be consistent with noise from the existing operations, which do not significantly adversely impact the environment.

Based on these evaluations and findings, the Proposed Action would not result in significant adverse or significant positive impacts to the noise environment at Robins AFB and the surrounding area.

4.5 BIOLOGICAL ENVIRONMENT

4.5.1 No-Action Alternative

The No-Action Alternative would have neither significant positive nor significant negative impacts on the biological environment. No natural resources would be disturbed.

4.5.2 Proposed Action

Implementation of the Proposed Action would have no significant effect on the biological environment at or near the Existing Buildings Occupied by the 19th ARG Area, Proposed Construction Area and Ordnance Area. The base BMPs outlined in the Erosion, Sediment, and Pollution Control Plan will be implemented as designed to avoid potential adverse effects from disturbance of the soil, and adverse effects would, therefore, be insignificant.

Demolition and Renovation of Existing Buildings. No endangered, threatened or sensitive species would be affected by the demolition or renovation activities because none of these species or their habitats is located adjacent to the buildings proposed for renovation. Wildlife and vegetation would not be significantly adversely or positively impacted because no significant resources are located on or adjacent to the buildings to be demolished or renovated.

Construction of New Hangar and Parking Areas. No endangered, threatened or sensitive species would be affected by the construction activities in the Proposed Construction Area because none of these species or their habitats is located within the proposed construction area. The Proposed Action would not result in a significant impact to wildlife and vegetation because minimal vegetation (mainly grass) would be removed during hangar and parking lot construction and realignment of Beale Drive. Wildlife living in or using this area for foraging, nesting, etc. would relocate to other nearby similar areas, and adverse impacts to wildlife would not be significant.

Marine Corps Operations. Marine Corps operations would not affect endangered, threatened or sensitive species. The Proposed Action would not result in a significant impact to wildlife and vegetation.

4.6 CULTURAL RESOURCES

4.6.1 No-Action Alternative

Conducting no action would have no effect on cultural resources. Cultural resources on Robins AFB would continue to be managed and protected as required by federal and state agencies.

4.6.2 Proposed Action

In accordance with Sections 106 and 110 of the National Historic Preservation Act (NHPA), as amended, 78 CEV/CEG provided a copy of the Draft Final EA to and consulted with the Georgia SHPO regarding the project as planned; the SHPO responded in a letter dated 9 August 2007 (see **Appendix C** for copies of the agency correspondence).

Demolition and Renovation of Existing Buildings. Demolition and renovation activities would not involve major ground-disturbing activities and the areas surrounding the existing buildings have already been disturbed by previous construction activities;

furthermore, previous base surveys for archaeological resources have not identified any resources in these areas. Therefore, 78 CEG/CEV determined that no archaeological resources would be affected by implementation of this aspect of the Proposed Action; the SHPO's 9 August 2007 response letter provided SHPO's concurrence of this determination (see **Appendix C**).

The Proposed Action also includes renovation of Buildings 97, 106 and 2067, which are eligible for the NRHP. Proposed renovation activities for Building 97 would be strictly functional and would include replacing broken roll-up doors, lighting and security locks and painting. Proposed renovation activities for Building 106 would also be strictly functional and include replacing the rollup door, retarring of the roof, replacing water-damaged ceiling tiles, lighting and security locks, and repainting the building. Proposed renovation activities for Building 2067 are similar in nature and would include replacing the current door with a new roll-up door, and repairing, patching and painting interior finishes as necessary throughout the building.

78 CEG/CEV determined that the Proposed Action renovations are minor and would not impact the historic integrity of the NRHP-eligible buildings. In their letter dated 9 August 2007, the SHPO stated that they believe the proposed project will have no adverse effect on Buildings 97, 106 and 2067 as defined in 36 CFR 800.5(d)(1) (see **Appendix C**). However, if renovation plans change, notification of the Robins AFB Cultural Resources Manager (CRM) will be required and 78 CEG/CEV will further review the project changes with the SHPO as necessary.

Construction of New Hangar and Proposed Parking Areas. Based on previous surveys, no archaeological resources would be affected by the construction aspects of the Proposed Action; SHPO concurred that archaeological resources would not be impacted by the project (see **Appendix C**). No standing structures are located within the Proposed Construction Area, and no effect on historic cultural resources on Robins AFB would occur due to the construction activities.

The necessary construction fill, while its precise source cannot be identified at this time, will come from an existing commercial source fully permitted under applicable laws protecting the environment; therefore, no effect on cultural resources at the borrow area would occur.

Inadvertent Discoveries: When cultural resources are inadvertently discovered, project personnel are directed to avoid the site of discovery and immediately contact the Robins AFB CRM. All work in the area of discovery must stop until it can be investigated. The CRM will send a qualified representative to visit the discovery site. The resource will then be recorded, evaluated, and the effects mitigated as necessary.

Marine Corps Operations. Marine Corps operations would not affect archaeological or historic resources at Robins AFB.

4.7 SOCIOECONOMIC ENVIRONMENT

4.7.1 No-Action Alternative

The socioeconomic environment would not change significantly under the No-Action Alternative, when compared to the economy associated with Robins AFB and the Warner Robins area. Robins AFB would continue to exert a significant positive impact on the economy of the Middle Georgia region of influence. However, the loss to the local economy associated with 19th ARG's departure would be more noticeable, as the positive offset achieved by the construction and operating dollars associated with the Marine Corps relocation would not be realized.

Minority populations and low-income populations would not be significantly adversely or significantly positively impacted under the No-Action Alternative. Nor would significant environmental health risks and safety risks to children occur.

Hence, implementation of the No-Action Alternative would result in neither significant positive nor significant negative effects to the local socioeconomic environment.

However, the No-Action Alternative would not comply with BRAC 2005, which is intended to streamline operations and reduce costs associated with national defense. Thus, the No-Action Alternative would result in an adverse, although insignificant on a national scale, impact to the socioeconomy.

4.7.2 Proposed Action

Implementation of the Proposed Action would reverse the temporary local adverse socioeconomic impact related to departure of the 19th ARG from Robins AFB in 2008. The Proposed Action would provide new economic stimulus to the regional economy through new construction expenditures and increased annual expenditures associated with operating and maintaining the Marine Corps facilities. Construction is expected to cost approximately \$27.5 million in the form of construction labor salaries, equipment, materials, site improvements, pavements, communications and utilities. These costs would positively impact the socioeconomic environment, and most would likely be spent in the local area with local contractors, in FY 08 through FY 10, as the construction would take approximately 18 months to complete.

Approximately 100 Marine Corps personnel would occupy on-base housing and approximately 100 Marine Corps personnel would occupy on-base dormitories; the remaining 100 personnel would rent or purchase housing off base. While this would be less than the approximate number of 19th ARG personnel currently living off base, it would result in an increased number of new rentals or housing purchases when compared to the situation after the 19th ARG's departure in 2008.

Drill weekends would generate additional expenditures to Robins AFB and Warner Robins when the approximately 600 Reserve Marines would report to Robins AFB for one weekend per month. Approximately 40 to 50 base dormitory rooms would be used for drill weekends, while the remaining Reserves would reside in nearby hotels from Friday night to Sunday morning. The Reserve Marines and 116th ACW would consult and select different drill weekends to assure that Robins AFB and nearby Warner Robins hotels could handle the influx of Reserves.

The Marine Corps has an approximate \$19 million annual aircraft operating budget and an approximate \$285,000 annual personnel operating budget.

No significant adverse environmental impacts would occur as a result of the Proposed Action and no populations (minority, low-income, or otherwise) would be disproportionately impacted; therefore, no significant impacts with regard to environmental justice would occur. Construction impacts would be insignificant, and the future operations under the Proposed Action would otherwise not result in significant adverse impacts to the environment.

4.8 TRANSPORTATION AND SAFETY

4.8.1 No-Action Alternative

Under the No-Action Alternative, there would be no significant positive or significant adverse effects to transportation. The local traffic patterns and conditions existing after the 19th ARG's departure would not change because the Marine Corps would not relocate to Robins AFB. National security, however, would be adversely impacted because the Marine Corps would not be able to fulfill its mission without other actions occurring to meet the need for Marine Corps operations that will be relocated from NAS Atlanta.

4.8.2 Proposed Action

Demolition and Renovation of Existing Buildings, and Construction of New Hangar and Parking Areas. Implementation of the demolition, renovation and construction phases of the Proposed Action would not significantly positively or significantly adversely impact traffic safety at Robins AFB or the surrounding area. Construction traffic would enter the base at Gate 4 and travel on existing paved roads to access the area.

Traffic would be minimally altered by the realignment of Beale Drive. Beale Drive would remain open during construction and the realignment would be designed for safe traveling conditions.

Construction and renovation activities would involve the operation of heavy machinery and other equipment. Adhering to all applicable safety regulations and guidelines would result in insignificant safety concerns.

Marine Corps Operations. Traffic flow would increase in the area as the buildings became occupied, however the increase during the week would not be greater than current 19th ARG traffic. Existing parking lots and the two proposed new parking lots would be used for POVs and provide adequate parking for Marine Corps personnel. Additionally, on average approximately 10 deliveries would be made to the Marine Corps facilities per week, which is less than the number of deliveries to the 19th ARG facilities. Although the total number of vehicle trips associated with the Marine Corps would be less than the current number associated with the 19th ARG on a weekly basis, it would be more than the number of vehicle trips in the area immediately after the 19th ARG's departure.

Operations at the new hangar would involve the maintenance and operation of equipment and other machinery by Marine Corps personnel. Adhering to all applicable safety regulations and guidelines would result in insignificant safety concerns.

Additionally, Marine Corps helicopter flight patterns would be conducted in accordance with Robins AFB flight operation procedures. A modified flight pattern would be used as needed to strive to avoid conflicting with existing, large fixed-wing aircraft traffic and to ensure insignificant safety issues associated with the helicopter operations; the existing APZ would not require modification due to the Marine Corps operations at Robins AFB. Furthermore, Marine Corps operations have maintained high safety levels; the last major accident involving the unit relocating from NAS Atlanta occurred in March 1991 and the operations at Robins AFB would be consistent with the types of operations already being conducted at NAS Atlanta.

Aircraft would be loaded and armed at Robins AFB prior to departing for ordnance training flights. Aircraft loading would occur at the Christmas Tree area, requiring the transportation of ordnance. Ordnance transportation routes could require new speed limits and posting of signs between the MSA and the Christmas Tree area to indicate caution for ordnance-laden vehicles. Ordnance loading previously occurred in this area, so the Marine Corps operation would not be a new operation for this area of the base.

The Marine Corps operations would not change the APZs at Robins AFB.

4.9 CUMULATIVE IMPACTS

Council on Environmental Quality (CEQ) regulations stipulate that potential environmental impacts resulting from cumulative impacts should be considered within an EA. A cumulative impact is the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. In accordance with NEPA, a discussion of cumulative impacts resulting from projects that are proposed, currently under construction, recently completed, or anticipated to be implemented in the near future is presented below.

Several BRAC and other MILCON projects are in progress, planned, or proposed at Robins AFB. These actions are being evaluated in separate environmental documentation when required.

Of the future BRAC actions, only the relocation of the 202nd Engineering Installation Squadron (EIS) on the western side of the airfield (between Centurion Boulevard and Eagle Avenue) was identified as potentially producing cumulative environmental effects in the immediate vicinity of the Proposed Action area. The 202nd EIS will relocate existing vehicle maintenance and headquarters/operations functions to Buildings 2312 and 2326, respectively. To provide for a vehicle maintenance shop and associated parking shed, this project includes the renovation of approximately 8,550 square feet of existing building space and creation of 15,000 square feet of new parking area. To provide for a headquarters/operations facility, this project includes the renovation of approximately

29,000 square feet of existing building space to provide communications/electronics, training, shops, office and storage space. Approximately 125 personnel from the 202nd EIS would relocate from Middle Georgia Regional Airport in Macon, Georgia to this area of Robins AFB as a part of this action. The 202nd EIS project would increase the area of permeable land surface and temporarily increase air emissions, noise, and volume of solid waste and toxic materials generated by construction/renovation activities. On a long-term basis, this project would increase the generation of solid waste and sanitary wastewater, and the consumption of potable water.

Actions (not related to BRAC) that were identified as potentially producing cumulative environmental effects in the immediate vicinity of the Proposed Action area include the construction of an Avionics Maintenance facility and a Maintenance Squadron facility for the 116th ACW; and the departure of the 19th ARG. The two 116th ACW projects are located on the eastern side of the airfield between Blunk Drive and Borghese Drive (separated by Taxiway Lima). The Avionics Maintenance facility would be constructed on the eastern side of Taxiway Lima and require the demolition of an existing hangar (Building 2082). The Maintenance Squadron facility would be constructed on the western side of Taxiway Lima and require the demolition of another existing hangar (Building 2052). The construction and demolition activities associated with these projects would increase the area of permeable land surface and temporarily increase air emissions, noise, and volume of solid waste and toxic materials generated by construction/demolition activities.

Cumulative environmental effects resulting from the departure of the 19th ARG would be offset by the arrival of the Marine Corps units from NAS Atlanta. Approximately 550 19th ARG personnel would vacate their facilities at Robins AFB in 2008, and approximately 300 Marine Corps personnel would reoccupy the majority of the facilities in 2010. Similar maintenance operations and administrative functions would occur and result in the use and generation of similar materials and wastes.

Potential cumulative effects of all projects at Robins AFB will be addressed through existing permit requirements or by obtaining permit modifications as necessary.

Cumulative increases in storm water runoff due to increased impermeable area at the project areas would occur, but the increase in impermeable area would not result in significantly adverse cumulative impacts. The base will implement practices under an approved Erosion, Sediment and Pollution Control Plan, designed for effects on storm water and surface water quality to be insignificant. Also, the cumulative effect of numerous construction projects on storm water will be addressed, as appropriate, under an approved Erosion, Sediment and Pollution Control Plan, designed for effects on storm water and surface water quality to be insignificant.

Cumulative increases in the generation of toxic materials could occur from the renovation/demolition activities at the project areas. ACM, LBP and PCB-containing equipment surveys would be performed on all structures prior to renovation/demolition. Identified ACM, LBP and PCBs would be removed and disposed of in accordance with applicable regulations. Removal of toxic materials at the sites would be a positive impact.

The construction/demolition phase of these actions would increase CO, hydrocarbons and NOx from construction employee traffic and operation of heavy equipment. However, the increase in emissions from construction worker vehicles would be temporary and insignificant to the environment when considered in the context of Robins AFB and the nearby areas.

Cumulative increases in the generation of solid waste would occur from construction, renovation and demolition activities. Waste materials would be recycled as feasible; the increases would occur during the construction/renovation activities and would not be significant when compared to the total solid waste generation for Robins AFB.

The effects of noise generation by construction activities associated with the proposed projects would be temporary and insignificant. The proposed projects would affect noise generation at Robins AFB in the long-term as some of the aircraft at Robins AFB, which generate a continuous noise, would be replaced with helicopters, which generate a pulsating noise. While the noise type is different, the decibel levels are comparable. The fixed-wing aircraft has an average decibel level of 99 db; the helicopters have an average

decibel level of 105 db. According to OSHA, these decibel levels are considered levels at which sustained exposure may result in hearing loss but lower than levels that cause pain. Additionally, helicopters can alter their flight patterns easier than fixed-wing aircraft, which allows for noise abatement procedures to be easily incorporated into helicopter flight patterns. Noise abatement procedures include no low-altitude flying near noise sensitive receptors. Therefore, noise would not have a cumulative adverse effect on the environment.

Conducting these actions would produce slight positive effects within the region of economic influence during the construction/demolition of the facilities. The cumulative effect of the projects would result in significant beneficial economic impacts to the local economy.

The implementation of the actions would not produce significant adverse or significant positive short-term or long-term cumulative effects. The remaining environmental resources and elements would not be significantly adversely affected or positively affected on a cumulative level because these resources and elements would not be significantly affected under the Proposed Action, and the other listed projects were not identified as significantly impacting these resources. Thus, a significant cumulative effect would not occur from the implementation of the Proposed Action.

5.0 LIST OF PREPARERS

Charles Allen, P.E. – Independent Technical Reviewer, URS - Mr. Allen has a B.S. in Civil Engineering, and is a Professional Engineer with over 35 years experience on a variety of NEPA environmental impact assessments, civil, geotechnical, and seismic engineering projects, Phase I and II Environmental Site Assessments, waste stream and pollution prevention projects, environmental permitting, and hazards analysis. He has served as the Independent Technical Reviewer for several NEPA EAs prepared on behalf of 78 CEG/CEV and for several other Federal agencies including U.S. Department of Veterans Affairs, U.S. Department of Justice, U.S. Army Corps of Engineers, U.S. Postal Service, among others.

Kenneth Branton – Program Manager, URS - Mr. Branton has a B.S. in Mining and Petroleum Engineering. He is a retired Lieutenant Colonel (LtCol) from the U.S. Air Force with 22 years of service as a Bioenvironmental Engineer. LtCol Branton served as the Deputy Director of Environmental Management at Robins AFB and the Chief of the Environmental Restoration Division from 1991-96. He also served as the Deputy Director of the Air Force Environmental Research Laboratory at Tyndall AFB from 1996-98. He completed the Shipley course on “*How to Manage the EIAP/NEPA Process: Air Force Specific (EIAP)*” in 1992 and has conducted environmental impact assessments and served as the Independent Technical Reviewer on numerous Air Force and FEMA projects. Mr. Branton has nine years’ experience as a consultant environmental engineer of which seven years has been at Robins AFB as a Senior Program Manager managing all types of environmental projects for the conservation, compliance, remediation, and pollution prevention programs.

Dan Botto, URS - Mr. Botto has a B.S. in Aviation Business and more than 8 years of relevant NEPA, environmental and airport planning experience. He has prepared a multitude of aviation related noise analyses to evaluate the potential for significant noise impacts of projects on the surrounding environment, in addition to other aspects of the EA, EIS, Part 150 and Air Installations Compatible Use Zones documentation. Mr. Botto has served in this capacity on behalf of a variety of state, Federal and DoD agencies.

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Patricia Slade – Project Manager, URS - Ms. Slade has a B.S. in geology and more than 20 years of experience in NEPA documentation, environmental planning, environmental due diligence, and geological studies. She has served as the NEPA Project Manager for previous projects completed for the Air Force, U.S. Army Corps of Engineers, Federal Emergency Management Agency, U.S. Department of Justice, U.S. Department of Veterans Affairs, U.S. Postal Service, among others. She works on a variety of inter-disciplinary projects, including storm water/NPDES permitting, Phase I ESAs and Phase II investigations, geotechnical investigations, asbestos and lead-based paint surveys, cultural resources surveys, indoor air quality surveys, county-wide flood damage reduction projects, and regulatory compliance projects. She has performed or managed completion of numerous NEPA documents for a variety of federal and state agencies.

Chris Taylor – Environmental Scientist, URS - Mr. Taylor has a B.S. in geology and more than 18 years of relevant experience in environmental due diligence, NEPA documentation, and geological studies. He has prepared several NEPA EAs on behalf of 78 CEG/CEV and worked with other federal authorities for proposed development projects including the Air Force, U.S. Army Corps of Engineers, U.S. Department of Veterans Affairs, Federal Aviation Administration, U.S. Postal Service, among others. He works on a variety of inter-disciplinary projects, including Phase I ESAs and Phase II

investigations; geotechnical investigations; asbestos, lead-based paint, lead in drinking water and radon surveys; indoor air quality surveys; and regulatory compliance projects.

Ann Yarnell – Ecologist/Environmental Scientist, URS - Ms. Yarnell is an environmental scientist with a Bachelor's degree in environmental resource management and 7 years of relevant environmental and NEPA experience. She has prepared several NEPA EAs on behalf of 78 CEG/CEV and several other federal authorities for proposed development projects; and conducted over 200 NEPA screenings to evaluate the potential for significant effects of projects on endangered species and wetlands. Ms. Yarnell has assisted with multiple aspects of regulatory compliance from hazardous waste, air, waste water, storm water, spill response, and environmental compliance audits.

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APPENDICES

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APPENDIX A

ROBINS AIR FORCE BASE BACKGROUND INFORMATION

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1.0 INTRODUCTION

This appendix describes the existing environment in the area potentially affected by the alternatives being evaluated. The chapter begins with a description of the location, history, and current missions of Robins AFB. The remainder of the chapter is organized based on descriptions of the components of the environment that may be affected, in the following order: physical environment, air quality, biological environment, cultural resources, land use, noise environment, safety, socioeconomic resources, infrastructure, and waste management. The effects of the alternatives on the baseline conditions of each environmental component are evaluated in Chapter 4, Environmental Consequences. Only sections relevant to the subject EA are included.

2.0 BASE DESCRIPTION, HISTORY, AND CURRENT MISSIONS

Not relevant to this EA.

3.0 PHYSICAL ENVIRONMENT

Not relevant to this EA.

4.0 AIR QUALITY

4.1 Regional Air Quality

The State of Georgia is attaining the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants in the middle Georgia area with the following exceptions: ozone (O₃) and PM within Bibb and Monroe counties. Georgia is developing a State Implementation Plan (SIP) that outlines strategies to bring these counties back into attainment. Air quality in Houston County, which includes Robins AFB, is currently classified as an attainment area (i.e., pollutant levels are below the standards) for all NAAQS. Air monitoring stations closest to the base are located in Warner Robins and Macon.

4.2 Air Emission Sources

The maintenance and repair of aircraft are the primary stationary sources of air emissions at Robins AFB. The large number of aircraft serviced by the base in combination with the variety of aircraft types and services performed create a large and complex group of air emission sources. The primary emission sources include painting and depainting operations, solvent cleaning, and chromium plating and anodizing. Other sources include fuel storage tanks, peaking power generators, boilers, and various sources of fugitive volatile organic compounds (VOCs).

There are more than 30 individual painting operations located on the base, ranging from small booths used for parts to large hangars used for the exterior coating of transport aircraft. Emissions from these sources consist primarily of the volatile components of the paints.

Solvent-cleaning operations occur at nearly every step of the repair and maintenance activities. The cleaning processes include tank and vapor degreasing, although the majority are hand-wipe cleaning operations. Emissions from cleaning operations result from the evaporation of the cleaning agents and typically are fugitive in nature.

The boilers on the base are used primarily for generating steam for comfort heating of the buildings. Natural gas is used as the primary fuel, with No. 2 Diesel Fuel and Air Mixed Propane as backups for most of the large boilers.

4.3 Air Quality Requirements at Robins AFB

Robins AFB is subject to a number of air quality regulatory requirements, including the Georgia Rules for Air Quality Control, the U.S. EPA requirements under the Clean Air Act, including Titles III, V, and VI of the 1990 Clean Air Act Amendments, the National Emission Standards for Hazardous Air Pollutants (NESHAP), and the New Source Performance Standards (NSPS).

4.3.1 Title III Requirements

The original Clean Air Act was legislated in 1963. Much of the structure, lacking in the original Act, was established with the 1970 Clean Air Act Amendments (1970 Amendments). The Clean Air Act Amendments of 1990 (1990 Amendments), under Section 112, was the legislative vehicle that created additional source categories for the Title III National Emission Standards for Hazardous Air Pollutants (NESHAP) program. The intent of the standards is to protect public health by requiring existing and new major sources to control emissions to the level achievable by maximum achievable control technology (MACT), consistent with Section 112(d) of the 1990 Amendments. A listing of the chemicals and classes of compounds that are considered hazardous air pollutants (HAPs), also referred to as “air toxics,” is presented in Section 112(b) of the 1990 Amendments. The most significant NESHAP for Robins AFB is the aerospace manufacturing and rework facility NESHAP, also referred to as the “aerospace NESHAP.”

4.3.2 Aerospace NESHAP

Draft standards for aerospace manufacturing and rework facilities were proposed in the *Federal Register* on 6 June 1994. The final rule for the aerospace NESHAP was published in the *Federal Register* dated 1 September 1995 (codified as 40 CFR 63, Subpart GG) with final compliance occurring on 1 September 1998. The primary focus of this regulation is to address surface coating, depainting and solvent cleaning operations at aerospace manufacturing and rework

facilities. A list of the HAPs most commonly associated with this type of facility includes chromium compounds, cadmium compounds, methylene chloride, toluene, xylene, methyl ethyl ketone, ethylene glycol, and glycol ethers.

The aerospace NESHAP required that existing processes at military aerospace original equipment manufacturer (OEM) and rework operations that are subject to the NESHAP achieve compliance with the control requirements of the standards 1 September 1998. The aerospace NESHAP covers several air emission source categories specifically associated with the industrial activities at Robins AFB. The major air emission source categories applicable under the aerospace NESHAP for Robins AFB are: painting operations (primer and topcoat applications), depainting operations, solvent cleaning operations (hand wipe solvent cleaning and spray gun cleaning), and waste handling and storage operations (RAFB, 1996).

4.3.3 Chromium Electroplating and Anodizing NESHAP

Controlling emissions of hexavalent chromium, which poses the potential for significant health risks, was the impetus for imposing MACT standards on chromium electroplating and anodizing facilities. In addition, chromium is included on the HAP list in Section 112(b) of the 1990 Amendments. Draft standards were proposed in the *Federal Register* on 16 December 1993 for hard chromium electroplating, decorative chromium electroplating, and chromium anodizing processes. The final rule, including the MACT standards for this source category, was published in the *Federal Register* on 25 January 1995 (codified as 40 CFR 63, Subpart N).

The chromium electroplating and anodizing NESHAP applies to each existing chromium electroplating or chromium anodizing tank at facilities that perform hard chromium electroplating, decorative chromium electroplating, or chromium anodizing. Affected operations subject to this NESHAP are required to maintain compliance with the performance, work practice, and emission limit standards of this NESHAP. Decorative chromium electroplating tanks must be in compliance within one year after 25 January 1995; hard chromium electroplating or chromium anodizing tanks must be in compliance within two years after 25 January 1995. Robins AFB currently operates six sources subject to this NESHAP.

4.3.4 Halogenated Solvent Cleaning NESHAP

Draft standards for halogenated solvent cleaning operations were proposed in the *Federal Register* on 29 November 1993. The final rule, including MACT standards for this source category, was published in the *Federal Register* on 2 December 1994 (codified as 40 CFR 63, Subpart T). This NESHAP applies to any existing operation that includes a solvent cleaning machine(s) containing any combination of six specific halogenated HAP solvents (methylene

chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, and chloroform) in total weight concentration greater than 5 percent. Robins AFB currently operates three sources that are required to maintain compliance with the performance and emission control standards of this NESHAP (RAFB, 1996).

4.3.5 Title V Program

The Operating Permits program under Title V of the 1990 Amendments is the backbone for implementing the statute's requirements for industrial sources of air pollution. The program requires that all major sources of regulated air pollutants obtain a federally enforceable air operating permit under an EPA-approved program administered by the appropriate permitting authority (preferably state, regional, or local, but possibly EPA if there is no approved non-federal program). These permits are not intended to impose any new emission limits. The main goal of the permit is to identify and record existing requirements applicable to regulated sources and to assure compliance with these existing requirements. The existing requirements for Robins AFB include the aerospace NESHAP standards, the halogenated solvent cleaning NESHAP standards, and the chromium electroplating and anodizing NESHAP standards, discussed above (RAFB, 1996). Other existing requirements include the SIP and the NSPS for boilers.

The pollutants of concern for Robins AFB that will be addressed in the Title V air permit application for the base include HAPs and criteria pollutants. Robins AFB submitted its original Title V permit application in October 1996 with the fourth and final amendment being submitted in March 2003. The permit applications included both significant and insignificant air emission sources. The Title V permit was issued for Robins AFB in November 2003. For the purposes of Title V air permitting under the 1990 Amendments and subsequent implementing regulations, Robins AFB is considered to be a "major" source of air emissions for one or more regulated pollutants. Air emission levels for Robins AFB included in the March 2003 Title V air permit application are summarized in **Table 4-1**.

Table 4-1. October 1996 Title V Air Permit Application Emission Estimates for Robins AFB

Air Pollutant	Maximum Anticipated Actual Emissions (tons/yr)	Average Anticipated Actual Emissions for Next 5 years (tons/yr)
Particulate Matter	14.3	7.9
PM-10	13.9	7.7

Air Pollutant	Maximum Anticipated Actual Emissions (tons/yr)	Average Anticipated Actual Emissions for Next 5 years (tons/yr)
Sulfur Dioxide	31.4	15
Volatile Organic Compounds	281.5	208
Nitrogen Oxides	85.3	53.1
Total Hazardous Air Pollutants	155.6	137.0

Although Title V is a federal program, there is provision for each state, with EPA approval, to develop and administer its own Operating Permits program. Georgia is one of the states that has chosen to operate its own program with EPA oversight. Georgia submitted its program for EPA approval on 12 November 1993. The EPA published the final interim approval for Georgia's program in the *Federal Register* dated 22 November 1995. Georgia's Title V operating permit program became effective on 22 December 1995 (RAFB, 1996).

4.3.6 State Air Quality Permit

In the 1970 Amendments to the Clean Air Act, EPA was required to establish NAAQS. EPA established two levels of protection for the NAAQS, i.e., primary standards and secondary standards. The primary standards are designed to protect the public health and are set at levels that will protect the most sensitive individual. The secondary standards are meant to be equal to or more stringent than the primary standards and are designed to protect the public welfare. NAAQS now exist for six criteria pollutants, i.e., carbon monoxide, lead, nitrogen oxides, ozone, particulate matter, and sulfur dioxide. Robins AFB is located in an attainment area, which means that the NAAQS are being met in the surrounding area (Houston County).

4.4 Emission Reductions

The reduction of hazardous air emissions (HAPs) is an essential part of the pollution prevention program at Robins AFB. Included are reductions in the types and quantities of toxic materials (i.e., HAPs or other toxic materials listed as pollutants-of-concern) used and released to the atmosphere. Past and ongoing projects at Robins AFB have contributed to reductions in toxic material purchases and subsequent potential air emission reductions. These projects mainly have been and currently are being accomplished in the painting, repainting, and solvent cleaning processes. Major projects for reducing the usage of methylene chloride, phenol, and toluene are based on employment of a pressurized water/bicarbonate of soda paint-stripping process (Aquamiser) as a replacement for various chemical-based paint stripping/cleaning processes.

Other projects have reduced or eliminated the use of methyl ethyl ketone and methyl isobutyl ketone.

4.5 References

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5.0 BIOLOGICAL ENVIRONMENT

Not relevant to this EA.

6.0 CULTURAL RESOURCES

Cultural resources include prehistoric and historic sites, structures, artifacts, districts or any other physical evidence of human activities considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources include prehistoric and historic archaeological resources, as well as architectural resources. Prehistoric resources are evidences of human activity that predate the advent of written records in the region. Historic archaeological resources include campsites, roads, battlegrounds, and a variety of other structures from the period of recorded history in the region. Architectural resources include structures or districts of historic or aesthetic significance, such as buildings, bridges, and dams. To be considered for protection, such architectural structures normally must be more than 50 years old. However, more recent structures, such as those constructed during the Cold War era, may warrant protection if they manifest the potential to gain significance in the future. According to the terminology of the National Historic Preservation Act of 1966, all of the above cultural resources may be considered historic properties.

6.1 Regulatory Requirements

The need for Robins AFB to properly treat cultural resources is derived from various acts, agreements, and Air Force instructions, regulations, and directives, including:

- Antiquities Act of 1906
- Historic Sites Act of 1935
- National Historic Preservation Act of 1966, as Amended
- Architectural Barriers Act of 1968, as Amended
- National Environmental Policy Act of 1969, as Amended
- Executive Order 11593, Protection and Enhancement of the Cultural Environment
- Archaeological and Historic Preservation Act of 1974
- Public Buildings Cooperative Use Act of 1976
- American Indian Religious Freedom Act of 1978

- Archaeological Resources Protection Act of 1979, as Amended
- Native American Graves Protection and Repatriation Act of 1990
- Religious Freedom Restoration Act of 1993
- Native American Free Exercise of Religion Act
- Archaeological and Historic Resources Management (Department of Defense Directive 4710.1)
- Programmatic Memorandum of Agreement among the United States Department of Defense, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, as Amended
- Memorandum of Agreement for Cooperative Actions in Cultural Resource Management on Military Lands between the Department of Defense and the National Trust for Historic Preservation
- Cultural Resources Management (Air Force Instruction 32-7065)
- Natural Resource: Historic Preservation (Air Force Instruction 126-7)
- Environmental Quality (Air Force Policy Directive 32-70)

6.2 Known Cultural Resources

Under Section 110 of the National Historic Preservation Act (16 USC 470h-2), Robins AFB has been given the responsibility of conducting a cultural resources inventory and evaluation of all of its holdings. The earliest archaeological survey and cultural resources inventory on the base was conducted in 1977. The first major archaeological survey of Robins AFB was conducted in 1986. The main base property has since been completely surveyed for archaeological sites and historic structures/districts, and the survey work has been reviewed and accepted by the Georgia SHPO.

All upland Phase II archaeological testing has been completed and Robins AFB has a total of 15 archaeological sites eligible for listing on the National Register of Historic Places (NRHP). The historical/architectural survey of the base examined all structures on base and Robins AFB has a total of 26 buildings eligible for the NRHP. Two districts (12 structures) and 14 additional individual buildings have been recommended as eligible for inclusion on the NRHP (**Table 6-1**).

In addition to the general requirements for any Air Force facility to preserve cultural resources, Robins AFB currently is finalizing a Programmatic Agreement (PA) with the Georgia SHPO regarding maintenance activities on historic structures or in historic districts. Once the PA is finalized and signed, RAFB will be obligated to follow their requirements. If the stipulations of the PA are followed, base activities will have no adverse effects on any eligible historic structure or district. In addition, the *Integrated Cultural Resources Management Plan* (ICRMP) for Robins AFB was finalized December 2005. The archeological and cultural resources of Robins AFB have been summarized in the ICRMP.

The ICRMP and the draft PA specify the constraints on activities in or near the 26 eligible historic structures and two eligible historic districts. Basically, no activity is allowed that will detract from the attributes that made the structure or district eligible for the NRHP. If potential adverse effects threaten any eligible resource, and if the undertaking cannot feasibly be redesigned to avoid the effects, the adverse effects are to be mitigated through data recovery investigations and documentation under a plan reviewed and accepted by the SHPO.

Table 6-1. NRHP Eligible Historic Structures and Districts on Robins AFB.

Resource	Description	NRHP Recommendation
Crew Readiness Facility (Building 12)	Altered, but contains Cold War significance, constructed in 1960.	Eligible. SHPO concurs.
Armaments Production/Assembly Facility (Building 94)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 97)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 98)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 105)	Built in 1960.	Eligible. SHPO concurs.
Munitions Storage Facility (Building 106)	Built in 1960.	Eligible. SHPO concurs.
Sentry Police Administration Facility (Building 107)	Built in 1960.	Eligible. SHPO concurs.
Control Tower and Operations Hangars (Building 110)	The original control tower/operations building, built in 1942.	Eligible. SHPO concurs.
Maintenance Hangar (Building 125)	Largest building at Robins AFB, constructed in 1942.	Eligible. SHPO concurs.

Resource	Description	NRHP Recommendation
Original Post Headquarters (Building 220)	The original base headquarters, built in 1942.	Eligible. SHPO concurs.
Officer's Circle District (Buildings 400, 405, 410-412, 415, 450)	Five two-story residential buildings and two storage structures constructed 1942; Colonial Revival style.	Eligible. SHPO concurs.
Chief's Circle District (Buildings 500-502, 504, 505)	Five two-story residential buildings, constructed 1942; Colonial Revival style.	Eligible. SHPO concurs.
PAVE-PAWS Facility (Building 1400)	Surveillance radar, constructed 1986. Contains Cold War significance.	Eligible. SHPO concurs.
Maintenance Hangar (Building 2067)	Constructed for large aircraft in 1960.	Eligible. SHPO concurs.
Maintenance Hangar (Building 2081)	Constructed for large aircraft in 1960.	Eligible. SHPO concurs.
Munitions Storage Igloo (Building 2108)	Constructed for munitions storage in 1990.	Eligible. SHPO concurs.

7.0 LAND USE

Not relevant to this EA.

8.0 NOISE ENVIRONMENT

8.1 Assessment of the Noise Environment

In assessing the noise environment at an Air Force base, models such as the NOISEMAP program from the Department of Defense are used to estimate noise contours surrounding the facility. These models typically incorporate aircraft and engine type, flight frequency, flight track distances and turns, altitudes, airspeeds, power settings, aircraft maintenance locations and orientations, and ground runup power settings, as well as environmental conditions (temperature and humidity), to generate overall noise contours for the facility. Aircraft noise is generated by

engine operation as well as by drag on moving aircraft. The noise contours are based on the Day-Night Average Noise Level (DNL), in units of decibels (dB). The annual average DNL is a descriptor used by the Air Force to assess exposure to aircraft noise, predict community response to various noise levels, and identify compatible land uses (USAF, 1998).

Robins AFB has conducted noise modeling as part of the Air Installation Compatible Use Zone (AICUZ) study, which contains detailed discussion of noise modeling techniques and results for Robins AFB (USAF 1993). The AICUZ noise analysis of airports is primarily concerned with identifying off-base areas that encounter elevated noise levels. The most recent noise contour data is presented in the Joint Land Use Study (MGRDC, 2004), which can be found on the web site http://www.mgrdc.org/code/docs/pdf/jlus_info.pdf.

The DNL values for land use planning are 65, 70, 75, and 80+ dB. When DNLs are below 65 dB, no land use restrictions are required. The Air Force suggests no residential development where DNLs are greater than 65 dB. However, if residential dwellings are present where DNLs are greater than 65 dB, it is suggested that the dwellings incorporate noise reduction measures. Commercial and/or retail land use is not compatible where DNLs are above 80 dB, and buildings should incorporate noise reduction measures where DNLs are 70-80 dB. Industrial land use is generally compatible with all DNLs, as are most agricultural and open space land uses.

The base maintains its noise levels in accordance with the Air Force Occupational Safety and Health (AFOSH) program.

8.2 Noise Environment at Robins AFB

The noise environment at Robins AFB is dominated by aircraft operations, primarily from the KC-135R, C-130E/J, E-8C, EC-137, F-15, C-5, and C-17, along with numerous aircraft in transit. Light civilian aircraft and civilian cargo planes also operate at Robins AFB on a limited basis (United States Air Force [USAF], 1993). During FY06, Robins AFB had an average of 79.7 flight operations per day for a total of 28,698 operations per year. Other noise sources such as construction activities or heavy machinery are minor in comparison to the aircraft noise generated on approach, landing, and take-off, and during maintenance-related engine runs.

Flight patterns at Robins AFB were established to: avoid heavily populated areas; concur with Air Force criteria regarding speed, rate of climb, and turning radius for each aircraft type; minimize noise levels, especially night; and minimize conflict with civilian aircraft. The basic flight patterns used at the base include straight-out departures, straight-in approaches, overhead landing patterns, instrument flight rule (IFR) or radar closed patterns, visual flight rule (VFR) or closed patterns, and re-entry VFR patterns. Engine runup locations have been established in

areas that minimize noise levels for the base population as well as the surrounding community. To further help minimize noise levels, normal base operations avoid late-night engine runups or departures.

As part of the continuing process of evaluation of the noise environment at Robins AFB, an AICUZ analysis was performed in the Fall of 1997 to reflect the assignment of new aircraft to the base, the transfer of aircraft from the base, and continued operation of previously assigned missions. **Figure 3-3** presents noise contours and accident potential zones on and off the base from this 1997 *AICUZ Study* (USAF, 1998).

The most recent published noise modeling results for Robins AFB (USAF, 1998) indicated DNL zones of 65-70 dB and 70-75 dB extending off the base. Most of the land under the noise contours extending off-base is undeveloped, and this land likely will not be developed since it is within the Ocmulgee River floodplain. However, several areas of commercial, industrial, and/or residential development also occur where DNLs are greater than 65 dB. In the city of Warner Robins and in Houston County, areas along US Highway 129 north of Green Street and areas east of US Highway 129 and north of the clear zone for Runway 15 lie within the 65-70 dB contour. Residential dwellings and mobile homes in these areas are considered incompatible land uses unless they incorporate noise reduction measures. Some residential areas in Bibb County (northeast of the base) also have DNLs of 65-70 dB and 70-75 dB. These areas also are incompatible with residential dwellings and mobile homes unless noise reduction features are incorporated into their design (USAF, 1998).

8.3 References

Middle Georgia Regional Development Center (MGRDC). 2004. *Robins Air Force Base and Middle Georgia 2004 Joint Land Use Study*.

U.S. Air Force (USAF).

1993. *Air Installation Compatible Use Zone (AICUZ) Study for Robins Air Force Base, Georgia*.

1998. *Air Installation Compatible Use Zone (AICUZ) Study for Robins Air Force Base, Georgia* (Volumes I-III).

9.0 SAFETY

Safety refers to those issues that directly affect the protection of human life and property. At Robins AFB, the predominant safety issues involve aviation, munitions, and fire prevention.

9.1 Aviation Safety

9.1.1 AICUZ Program

The Department of Defense (DoD) developed the AICUZ program for military airfields in order to protect aircraft operational capabilities while assisting local governments in protecting and promoting the health and safety of the public. AICUZ reports describe three basic types of constraints that affect or result from flight operations: noise zones (described in Section 3.8), accident potential zones, and height limitations on structures in the vicinity of airfields (USAF, 1998).

Accident Potential Zones

Accident potential zones are based on statistical analysis of past DoD aircraft accidents. DoD analysis has determined that the areas immediately beyond the ends of the runways and along the approach and departure flight paths have significant potential for aircraft accidents. Based on this analysis, DoD developed three zones that have high relative potential for accidents (**Figure 3-3**). The clear zone, the area closest to the end of the runway, is the most hazardous. The overall risk is so high that DoD generally acquires the land through purchase or easement to prevent development. At Robins AFB, the clear zones encompass areas 3,000 feet wide by 3,000 feet long and are within the base boundaries (USAF, 1998).

Accident potential zone I (APZ I) is an area beyond the clear zone that has a significant potential for accidents. APZ I is 3,000 feet wide by 5,000 feet long. Accident potential zone II (APZ II) is an area beyond APZ I that has a measurable potential for accidents. APZ II is 3,000 feet wide by 7,000 feet long. While aircraft accident potential in APZs I and II does not warrant acquisition of these areas by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public (USAF, 1998). Section 3.7.2 describes the actions taken by local governments, such as property acquisitions and zoning, to increase the safety of the public in APZ areas at Robins AFB.

Airfield Clearance Requirements

Height and obstructions criteria to assure airfield clearance and prevent hindrances to flight operations, defined in Federal Aviation Administration (FAR) Part 77, impose constraints on Robins AFB operations and facilities as well as off-base development. Imaginary planes and conical surfaces extending above and away from the airfield have been defined and criteria have

been established to govern the location and height of structures in the vicinity of the airfield. As a result, no hazardous obstructions exist within clearance zones at Robins AFB.

9.1.2 Bird/Wildlife Aircraft Strike Hazard (BASH) Program

The potential for bird/wildlife aircraft strikes poses a considerable hazard to aircraft and their crews. The purpose of the *Robins AFB Bird/Wildlife Aircraft Strike Hazard (BASH) Plan* 91-212 (RAFB, 2007) is to provide guidance to minimize or eliminate aircraft exposure to potentially hazardous bird strikes, as well as strikes of terrestrial animals on the runway. The plan is reviewed annually in March. Comments are forwarded to 78 ABW/SEF for coordination. The Office of Primary Responsibility (OPR) for the plan is the 78 ABW Flight Safety Office (78 ABW/SEF).

The BASH plan is based on hazards from both permanent (non-migratory) bird populations, seasonal (migratory) bird populations, and other animals. Implementation of portions of the plan is continuous, while other portions require implementation as required by increased bird or animal activity in the vicinity of the runway. The hazards to safe flying posed by birds and animals are so varied that no single solution to the bird strike problem exists. Specific actions contained in the plan include:

- Establishment of a Bird/Aircraft Strike Hazard Working Group (BHWG);
- Development of procedures to identify and communicate high hazard situations to aircrews and supervisors and to determine if altering/discontinuing flying operations is required;
- Determination of aircraft and airfield operating procedures to avoid high hazard situations;
- Dissemination of information on specific bird hazards and procedures for avoidance to all assigned and transient aircrews; and
- Elimination, reduction, or control of environmental factors that attract birds or animals to the airfield. Because birds or other animals usually are attracted in numbers by the existence of standing water, vegetative cover (trees, shrubs, tall grasses), or landfills, the base is working to eliminate these attractions in the vicinity of the runway.

9.2 Munitions Safety

Installations with munitions or other explosive storage, handling, and maintenance facilities are required to establish safety clearance zones around these facilities. Air Force Manual (AFM) 91-20, *Explosives Safety Standards*, requires that defined distances be maintained between

explosives storage and handling areas and a variety of other types of facilities. These distances define quantity-distance (QD) zones. Each munitions storage or handling facility has a QD zone extending from the sides and corners of the building outward for a prescribed distance, resulting in a series of arcs that define the perimeter of the QD zone. The size of a QD zone depends on several factors, including the type and quantity of explosives contained in the facility. The quantity is based on the net explosive weight (NEW) of the munitions, i.e., the weight of the actual explosives in the munitions not including the weight of the steel casing or other non-explosive components. In addition, munitions storage facilities must be located in areas where security of the munitions can be ensured.

Air Force safety regulations define many factors that affect QD requirements. One of these factors that may be a significant constraint to adjacent development is the allowable distance to an inhabited building (IB). The IB distance is also required to be maintained between explosive storage and handling locations and base boundaries, roadways, or the perimeter of any existing “local restrictive easement estate” or agreement. The IB distance does not apply if the base or restrictive easement boundary is located adjacent to land that is open and unsuitable for habitation or public gatherings. Property within QD zones must be owned, leased, or controlled by the base or its tenants, or an easement must be acquired that restricts use of the property to those uses compatible with the safety requirements of AFM 91-20.

Explosive QD safety zones have been established for four areas at Robins AFB: the Hot Cargo Pad, QL Area, Aircraft Loading Area, and PRIME BEEF Training Area. QD arcs of 1,250-foot radius have been established for the first three areas, and a 500-foot radius arc encircles the PRIME BEEF training area, which is approved for training exercises using live ammunition. The Hot Cargo Pad in the northwestern section of the base between taxiways 3 and 4 has been designated for the loading and unloading of explosives, munitions, and other dangerous cargo from parked aircraft. The QL Area on the eastern edge of the airfield originally was developed and used for storing B-52 munitions when Robins AFB was a Strategic Air Command base. It currently is used for storage of Air Combat Command developmental munitions and by the Georgia Air National Guard for storage of munitions for the fleet of B-1B bomber aircraft. The Aircraft Loading Area is located on the eastern edge of the airfield immediately south of the QL Area.

9.3 Fire Protection

9.3.1 Fire Stations

Robins AFB has four fire/crash stations on the base. Station No. 1 (Building 377) is approximately 18 years old and is 6000 square feet. There are five truck stalls in which fire, rescue, and hazardous materials units are kept. The sleeping capacity of this station is ten.

Station No. 2 (Building 109) is approximately 43 years old and is 8000 square feet. There are seven truck stalls in which crash, fire, rescue, and hazmat units are kept. The sleeping capacity of this station is 17. Station No. 3 (Building 664) is approximately 13 years old and is 1200 square feet. There is one truck stall in which a fire unit is kept. The sleeping capacity of this station is four. Station No. 4 (Building 2086) is approximately 18 years old and is 3500 square feet. There is one drive-through truck stall that will hold two crash station vehicles. The sleeping capacity of this station is four.

9.3.2 Equipment

The current inventory of response vehicles includes two Chief carryalls, one rescue truck, four crash trucks, two tankers, one hazardous materials van, one ladder truck, three pumpers, and four burden carriers. Robins AFB has the following facilities for fire and rescue training: a full-scale aircraft mock-up for live fire training (using JP-8 as the fuel), a simulated confined space apparatus, a four-story smokehouse, and additional equipment to simulate fire, rescue, and hazardous materials incidents.

9.3.3 Response Times

The response time requirement for structural emergencies is for the first pumper to arrive within five minutes and the second pumper within ten minutes. For unannounced aircraft emergencies, the first major aircraft rescue and fire-fighting (ARFF) vehicle has to arrive within three minutes and subsequent vehicles within 30-second intervals to any location on the flightline or industrial area. For pre-announced emergencies, the first major ARFF vehicle has to arrive within one minute and subsequent vehicles to arrive within 30-second intervals to any location on the flightline or industrial area.

9.3.4 Fire Alarms and Sprinklers

Most industrial and public assembly facilities are protected by automatic fire alarms connected to the fire station through radio-transmitted alarms. The systems communicate through the radio transmissions to two base stations (Buildings 322 and 2086) manned by Fire Department personnel. There are on going projects to repair, upgrade, and improve older facility fire alarm

systems on base. Most sprinkler equipped facilities are connected to the fire protection water storage tanks. However, some of the larger facilities (such as 93rd Air Control Wing hangars) have sprinkler systems connected to their own water tanks.

9.3.5 Planned Improvements

A replacement facility for Station No. 2 is in the planning stage. It will be a combination crash/fire/rescue station with drive-through stalls. A replacement live fire training area MILCON project is in the process of being built in the same location as the existing training area and will be finished by the close of 2002. The live fire training will be fueled with propane instead of the JP-8 previously used. Increased water storage capacity for the north side of the base is also planned. An interconnection water main under the runways is being planned between the northeast (93rd Air Control Wing) area of the base and the northwest (116th Bomb Wing) area of the base to take advantage of the elevated water storage east of the KC-135 ramp to resolve low water pressure issues in the northwest area of the base. A basewide hydraulic study is in progress to define any other deficiencies in the potable water/fire protection water systems. The results of this study will allow the planning necessary to improve these systems to support any increases in base workload with adequate fire protection and potable water services.

9.3.6 Assessment

Robins AFB currently has adequate fire protection. In addition to the base Fire Protection Division, there are also mutual aid agreements with the Houston County and Warner Robins Fire Districts. Training exercises with the base Fire Protection, county, and city personnel are held periodically to improve coordination of the different groups.

9.4 References

Robins AFB (RAFB). 2007. *Robins Air Force Base Bird/Aircraft Strike Hazard (BASH) Plan 91-202*. Robins Air Force Base, Georgia.

10.0 SOCIOECONOMIC RESOURCES

In 1994, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued to focus attention of Federal agencies on human health and environmental conditions in minority and low-income communities. In addition, EO 12898 aims to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed.

Based on EPA data (EPA, 2005), RAFB has a minority population greater than 40 percent and less than 10 percent of RAFB is below poverty level. The majority of the area adjacent to RAFB

has a minority population greater than 40 percent and greater than 30 percent of the area adjacent to RAFB is below poverty level (EPA, 2005). Houston County has a minority population of approximately 30 percent and approximately 10 percent of Houston County is below poverty level (U.S. Census Bureau, 2005).

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was introduced to minimize environmental health and safety risks to children. EO 13045 prioritized the identification and assessment of environmental health risks and safety risks that may affect children and to ensure that Federal agencies, policies, programs, activities, and standards to address environmental risks and safety risks to children.

According to Houston County Environmental Health Department, RAFB does not have any known environmental health and safety risks to children (Stewart, 2005).

The city of Warner Robins, Houston County, and the remaining Macon-Bibb County Standard Metropolitan Statistical Area (SMSA) constitute one of Georgia's fastest growing urban areas. From a town of 52 in 1940, before construction began on Robins AFB in 1941, Warner Robins had grown into a regional center of approximately 43,726 persons by 1990. During that time, the population of nearby Macon nearly doubled from 57,865 in 1940 to 106,210 in 1990 (MGRDC, 1994). The population of Warner Robins had grown to approximately 48,804 by the end of 2002 (WRMPO, 2005). According to the 2005 Economic Impact Statement the resident population (military and dependents) at Robins AFB is 4,948 (RAFB, 2005). The 2003 population of Houston County was estimated to be 120,434 and the nearby counties of Bibb and Twiggs had estimated populations of 154,287 and 10,466, respectively (U.S. Census Bureau, 2005).

The primary mission of Robins AFB, providing logistical support for the Air Force, requires substantial industrial activity and manpower requirements at the base. Robins AFB is the largest industrial complex in Georgia, containing 4.2 million square feet of maintenance shops, 1.8 million square feet of administrative space, 3.3 million square feet of storage space, 92.5 miles of roads (74.5 miles of which are paved), and 13 miles of railroad track. The runway is the largest in Georgia (12,000 feet long by 300 feet wide, with two 1,000-foot overruns). In addition to military and industrial facilities, Robins AFB includes a community which contains more than 1,400 family housing units and dormitories to accommodate 4,948 residents. Base residents are supported by services that include a 20-bed hospital, commissary, base exchange, bank, post office, library, chapel, recreational facilities, theater, and two elementary schools. In 2005, the replacement value of Robins AFB facilities was estimated to be \$5.2 billion (RAFB, 2005).

Robins AFB employs a workforce of approximately 19,772 people, of which 6,557 are military and 13,215 are civilian. Houston County is the residence of the vast majority (71 percent) of base

employees, followed by Bibb County (11 percent) and Peach County (4 percent). The remaining 14 percent of employees live in other counties, none supporting more than two percent of the workforce. Over the period 1995-2004, the number of personnel employed at Robins AFB has gradually increased from 17,022 (12,409 civilian and 4,613 military) in 1995 to 19,772 (13,215 civilian and 6,557 military) in 2004. This resulted in an overall increase of 16 percent in total employment, including a 7 percent increase in civilian personnel and a 42 percent increase in the number of military employees (RAFB, 2005).

In the past 61 years, Robins AFB has grown into a “mega” installation of more than 60 associated units, delivering everything from family services for our military members to command and control capabilities over distant battlefields. This diverse military complex is host to Headquarters Air Force Reserve Command, the E-8 Joint Surveillance and Target Attack Radar System (Joint STARS) aircraft of the 116th Air Control Wing, the KC-135 Stratotankers of the 19th Air Refueling Group, mobile communications experts in the 5th Combat Communications Group, and the Air Logistics Center (WR-ALC) which is designated the Airlift Center of Excellence for the Air Force.

During 2005, a new WR-ALC wing structure promoted capabilities based systems and aligns the AFMC with the operational Air Force. The wing structure leads us towards our WR-ALC FY05 Goal – to become a more valued team member of the world’s most respected Air and Space force by meeting or exceeding customer expectations for our outputs and creating an Air Force culture throughout our entire workforce. The four wings are:

330th Aircraft Sustainment Wing consolidates responsibilities for sustainment management of more than 5500 aircraft including C-130, C-5, C-17, F-15, U2, and E-8C JSTARS.

542nd Combat Sustainment Wing installs, distributes, modernizes and sustain over 800 combat systems including electronic warfare, avionics systems, support equipment, vehicles, basic expeditionary airfield resources, life support systems, automatic test systems and equipment, missiles and weapons.

78th Air Base Wing provides base operating support such as medical, civil engineering and security for Robins AFB and its 39 hosted Units.

402nd Maintenance Wing provides sustainment of avionics and electronic warfare systems, Programmed Depot-level Maintenance (PDM) and Unprogrammed Depot-level Maintenance (UDLM) for C-17 Globemaster III, C-130 Hercules, C-5 Galaxy, and F-15 weapon systems, as well as, supports over three million lines of software code for more than 40 unique weapon systems.

Potential growth in large aircraft maintenance provides one of the cornerstones for future depot maintenance workload at Robins, and we have programmed expansion of large aircraft hangar space in our budget planning. The expanded maintenance, engineering and management workloads have created an exciting challenge to attract, hire, and train a new generation of employees. After years of minimal hiring during military downsizing, the center expects to need between 300 and 500 new employees each year for several years into the future.

In fiscal year 2004, the base payroll, representing the combined gross salaries of all military and civilian employees, totaled approximately \$1,445.8 million. Both military and civilian salary totals have increased steadily since 1995 (\$740.7 million). The standard Air Force calculation of the economic impact of Robins AFB on Middle Georgia includes an annual payroll of nearly \$1,218 million, annual expenditures of \$246 million, and an estimated dollar value of jobs created of \$870 million (based on a job multiplier of 1.2). The Middle Georgia Regional Development Center estimates a \$2.3 billion impact from secondary jobs created as a result of Robins AFB. Including retiree payroll, the total annual impact is over \$4.2 billion (RAFB, 2005).

10.1 References

Middle Georgia Regional Development Center (MGRDC). 1994. *Robins Air Force Base and Middle Georgia Joint Land Use Study 1994*. Macon, Georgia.

Robins AFB (RAFB). 2005. *Economic Impact Statement 2005*. Public Affairs Office and Comptroller Squadron of the 78th Air Base Wing, Robins Air Force Base, Georgia.

U.S. Census Bureau. 2005. URL: <http://quickfacts.census.gov>.

U.S. Environmental Protection Agency (EPA). 2005. Enviromapper. URL: <http://www.epa.gov/enviro/html/em/>.

Warner Robins Metropolitan Planning Organization (WRMPO). 2005. URL: <http://warner-robins.org/>.

11.0 INFRASTRUCTURE

Not relevant to this EA.







12.0 WASTE MANAGEMENT

Not relevant to this EA.

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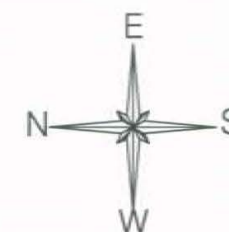
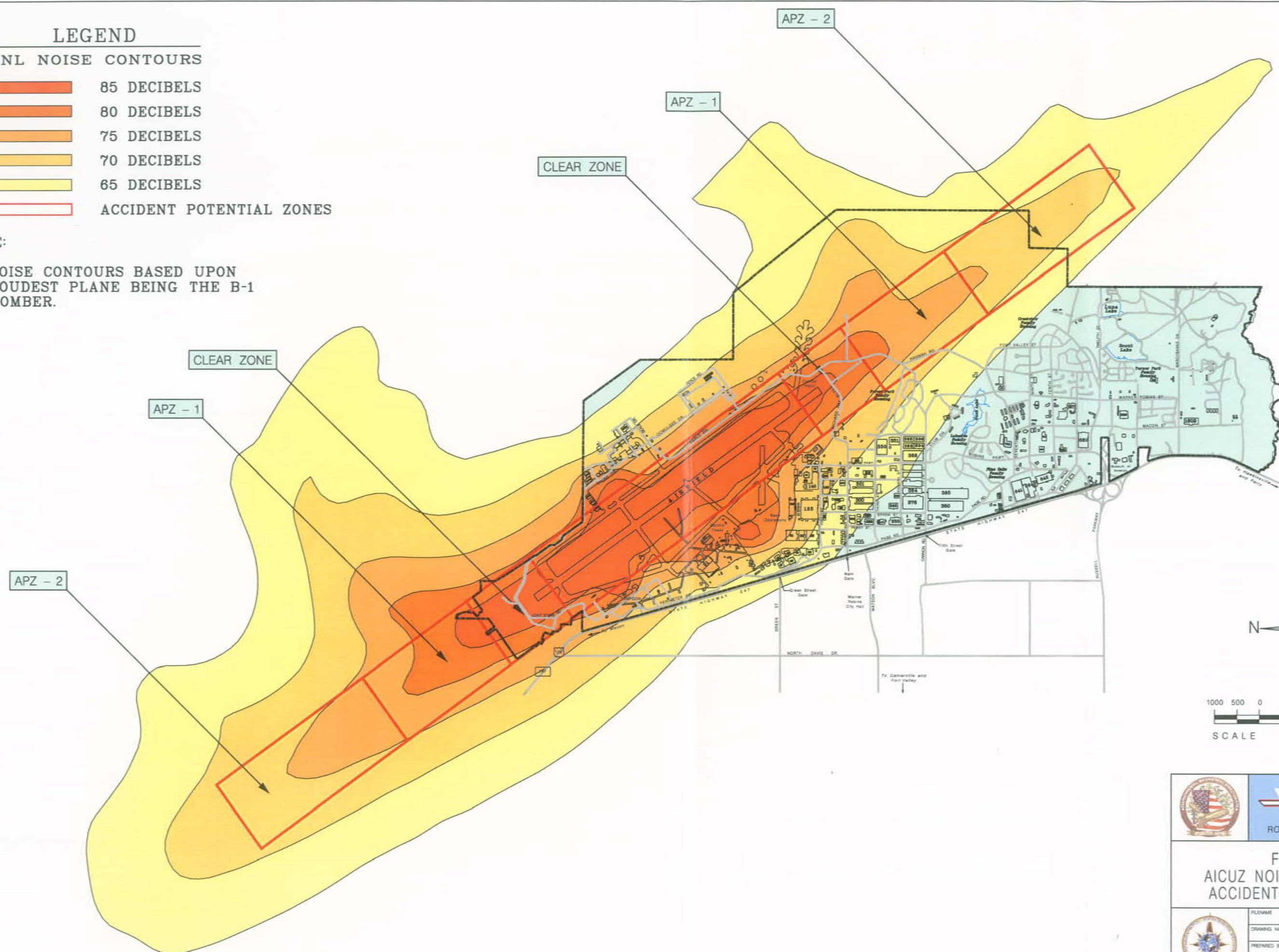
LEGEND

DNL NOISE CONTOURS

	85 DECIBELS
	80 DECIBELS
	75 DECIBELS
	70 DECIBELS
	65 DECIBELS
	ACCIDENT POTENTIAL ZONES

NOTE:

1. NOISE CONTOURS BASED UPON LOUDEST PLANE BEING THE B-1 BOMBER.



1000 500 0 1000 2000 3000
SCALE IN FEET



WRALC
ROBINS AIR FORCE BASE, GEORGIA

FIGURE 3-3
AICUZ NOISE CONTOURS AND
ACCIDENT POTENTIAL ZONES



FILENAME	FIGURE_3-3.dgn
DRAWING NO.	FIGURE 3-3
PREPARED BY	ET/JW
DATE	11/16/01
REVISION DATE	
REV	

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APPENDIX B

AGENCY/PUBLIC CORRESPONDENCE

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**PUBLIC NOTICE
FOR THE
DRAFT FINAL ENVIRONMENTAL ASSESSMENT
FOR THE RENOVATION/NEW CONSTRUCTION AND
OPERATION OF THE MARINE CORPS UNITS
(MAG-42, HMLA-773, and MALS-42) RELOCATED
FROM NAVAL AIR STATION ATLANTA TO
ROBINS AIR FORCE BASE**

Robins Air Force Base (AFB) announces the availability for public review and comment of the Draft Final Environmental Assessment (EA) and proposed unsigned Finding of No Significant Impact (FONSI) for the Facility Renovation/New Construction and Operation of Marines Corps Units (MAG 42, HMLA-773, and MALS-42) relocated from the Naval Air Station (NAS) Atlanta to Robins Air Force Base (AFB).

The proposed action consists of renovation of existing facilities and new construction at Robins AFB, and operation of Marine Corps units relocated from NAS Atlanta to Robins AFB. This action includes: renovation of existing hangars and buildings; construction of a new aircraft hangar and associated hardstand areas; relocation of a roadway adjacent to the new hangar; construction of two parking lots for privately owned vehicles; and renovation of existing ordnance storage buildings. Pursuant to the 2005 BRAC recommendations, the purpose of this proposed action is to provide adequate and efficient space for continued MAG-42, HMLA-773, and MALS-42 operations at Robins AFB so that their missions can be achieved.

No significant impacts to the environment are anticipated.

A copy of the Draft Final EA and proposed unsigned FONSI are available for public viewing and comment for the next 30 days in the Nola Brantley Memorial Library (also known as the Houston County Library), 721 Watson Blvd., Warner Robins, GA, 478-923-0128. For questions or comments, please contact the 78 Air Base Wing Office at FAX 926-9597 or address below:

78 ABW/PA
215 Page Rd, Suite 106
Robins AFB GA 31098-1662

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DEPARTMENT OF THE AIR FORCE

78th Air Base Wing (AFMC)
Robins Air Force Base Georgia

Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, 8th Floor
Atlanta, GA 30334
(404) 656-3855

78 CEG/CEVP
755 Macon Street, Building 1555
Robins AFB, GA 31098-2201

SUBJECT: Draft Final Environmental Assessment (EA), Renovation/New Construction and
Operation of Various Marine Corps Units Relocated from Naval Air Station Atlanta
to Robins Air Force Base

1. Request you please review the attached document by 12 Aug 07. We ask that you make your comments specific and note them on a separate sheet of paper rather than on the pages of the document. Negative replies should also be in writing to ensure continuity of documentation. If we do not receive your comments by 12 Aug 07, we will assume that the document is accepted as written.
2. Our point of contact is Mr. Sam Rocker at (478) 327-8373.

ROBERT SARGENT
Acting Chief, Environmental Programming Branch
Environmental Management Division

Attachments:

1. Draft Final EA (5 copies)

**GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS**

TO: Sam Rocker
Environmental Management Div.
Dept. of the Air Force

FROM: Barbara Jackson

DATE: 7/16/2007

SUBJECT: Executive Order 12372 Review

APPLICANT: Dept. of the Air Force - Robins AFB, GA

PROJECT: Draft Final EA: Facility Renovation / New Construction and Operation of
Marine Corps Units (MAG-42, HMLA-773 and MALS-42) Relocated
from Naval Air Station Atlanta to Robins AFB

CFDA #:

STATE ID: GA070716009

FEDERAL ID:

Correspondence related to the above project was received by the Georgia State Clearinghouse on 7/16/2007. The review has been initiated and every effort is being made to ensure prompt action. The proposal will be reviewed for its consistency with goals, policies, plans, objectives, programs, environmental impact, criteria for Developments of Regional Impact (DRI) or inconsistencies with federal executive orders, acts and/or rules and regulations, and if applicable, with budgetary restraints.

The initial review process should be completed by 8/13/2007 (*approximately*). If the Clearinghouse has not contacted you by that date, please call (404) 656-3855, and we will check into the delay. We appreciate your cooperation on this matter.

In future correspondence regarding this project, please include the State Application Identifier number shown above. If you have any questions regarding this project, please contact us at the above number.



DEPARTMENT OF THE AIR FORCE

78th Air Base Wing (AFMC)
Robins Air Force Base Georgia

78 CEG/CEVP
775 Macon St., Bldg 1555
Robins AFB, GA 31098

27 July 2007

Betsy Shirk
Environmental Review Coordinator
Historic Preservation Division
Department of Natural Resources
34 Peachtree Street, NW Suite 1600
Atlanta, GA 30303-2316

RE: Facility Renovations and New Construction and Operation of Marine Corps Units
Relocated from Naval Air Station Atlanta to Robins Air Force Base

Ms. Shirk

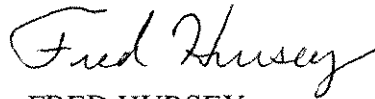
Based on a final Base Realignment and Closure (BRAC) recommendation, Naval Air Station (NAS) Atlanta is proposed for closure and tenant organizations are to be relocated to various other Department of Defense facilities located throughout the United States, including Robins Air Force Base. The Marine Forces Reserves' has proposed to relocate various Marine Aircraft Group units from NAS to various facilities at Robins AFB. This proposed relocation consists of the renovation of existing facilities and new construction activities.

Two National Register-eligible buildings will be impacted by the Marine relocation. Building 2067, currently used as a maintenance hangar, will be renovated to accommodate the Marine Corps ground supply warehouse. The proposed changes to the building are limited to replacing the current roll-up door with a new roll-up door and repairing, patching and painting interior finishes as necessary throughout the building. Building 97, currently used as an inert munitions-related storage warehouse, will be renovated to accommodate Marine Corps munitions build-up. The proposed changes to building 97 would be strictly functional and would involve replacing the broken roll-up doors, lighting and security locks and painting the interior as needed. The proponent understands that if the planned renovations change in scope, 78 CEG/CEV must be notified immediately as a continuation of the Section 106 process.

In addition to the NR-eligible buildings listed above, new construction for this project is also planned (see attached map). In 2003 Ellis Environmental Group performed an archaeological evaluation and soil survey that mapped areas on the base with intact soil profiles for future archaeological investigations (EEG 2003). This report shows that the soil over the entire airfield and many adjacent areas was found to have been significantly disturbed by construction activities, which took place between the mid 1940s and early 1960s. Additionally, the area proposed for the new Marine Corps facilities, northeast of the airfield along Blunk Drive, was

reclaimed from wetlands and built up with fill dirt during the late 1950s prior to the construction of the Cold War era buildings there.

Robins Air Force Base acknowledges a 30-day calendar day review period from the date we receive the return receipt. Should we not receive any comments within that time frame, we will assume you do not object to our request and we shall proceed with the project request as directed in 36 Code of Federal Regulation 800 and our State Historic Preservation Office approved Integrated Cultural Resources Management Plan. Should you have any questions or need further information, please contact Becky Crader at 478/327-8288.



FRED HURSEY
Chief, Environmental Programming Branch
Environmental Management Division

Attachments:

1. Map of Proposed Actions
2. Building 97 Photos, Map and Building Information
3. Building 2067 Photos, Map and Building Information

Georgia Department of Natural Resources

Noel Holcomb, Commissioner

Historic Preservation Division

W. Ray Luce, Division Director and Deputy State Historic Preservation Officer
34 Peachtree Street NW, Suite 1600, Atlanta, Georgia 30303-2316
Telephone (404) 656-2840 Fax (404) 657-1040 <http://www.gashpo.org>

August 9, 2007

Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

RE: Robins Air Force Base: Renovate and Construct Marine Corps Units MAG-22, HMLA-773, and
MALS-42
Federal Agency: US Air Force
Houston County, Georgia
GA-070716-0009

Dear Ms. Jackson:

The Historic Preservation Division (HPD) has reviewed the information submitted regarding the above referenced project. Our comments are offered to assist the US Air Force (USAF) and its applicants in complying with the provisions of Section 106 and Section 110 of the National Historic Preservation Act, as amended.

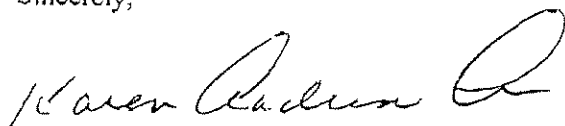
Based on the information provided, HPD believes that the proposed undertaking will have **no effect** on archaeological properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP), as defined in 36 CFR Part 800.4(d)(1). The subject project consists of renovations to existing buildings and construction of a new hanger at Robins Air Force Base, Warner Robins for use by relocated units of the U.S. Marine Corps air operations. As proposed, Building 2061 will be painted, Buildings 2065, 2066 and 2067 will be renovated for use as supply facilities, Building 2069 will be demolished, Building 2072 will be renovated for use as command and administrative offices, Building 2083 will be renovated for use as ordnance work space, and Buildings 97, 106, and 20008 will be renovated for use as ordnance storage. Additionally, a new helicopter hanger will be constructed and site work, including parking lots, road realignment, and a detention pond will occur. Buildings 97 (Munitions Storage) and 2067 (Hanger) are identified within the submitted materials as eligible for listing in the NRHP. The 2003 and 2004 survey reports conducted of Robins Air Force Base confirm the eligibility of these buildings, and also indicate that Building 106 was determined eligible and Building 2069 was determined ineligible for the NRHP. Summarized work descriptions for Buildings 97, 106, and 2067, except for replacement of roll-up doors, appear associated with security or cosmetic repairs. Therefore, HPD believes the proposed project will have **no adverse effect** on Buildings 97, 106, and 2067, as defined in 36 CFR Part 800.5(d)(1).

Please note that historic and/or archaeological resources may be located within the project's area of potential effect (APE), however, at this time it has been determined that they will not be impacted by the above-referenced project. Furthermore, any changes to this project as proposed will require further review by our office for compliance with Section 106 and Section 110.

Please refer to the project number referenced above in any future correspondence regarding this matter. If we may be of further assistance, please contact Elizabeth Shirk, Environmental Review Coordinator at (404) 651-6624, or Jackie Horlbeck, Environmental Review Historian at (404) 651-6777.

Jackson
GA-070716-009
August 9, 2007
Page 2

Sincerely,

A handwritten signature in black ink, appearing to read "Karen Anderson-Cordova". The signature is fluid and cursive, with a large initial "K" and a stylized "A".

Karen Anderson-Córdova
Unit Manager, Planning and Local Assistance Unit

KAC:jph

cc: Kristina Harpst, Middle Georgia RDC

AUG. -10' 07 (FRI) 07:53 GA. DEP. NATURAL. RESOR

TEL:404 657 1040

P. 003

Georgia Department of Natural Resources

Noel Holcomb, Commissioner

Historic Preservation Division

W. Ray Luce, Division Director and Deputy State Historic Preservation Officer
34 Peachtree Street NW, Suite 1600, Atlanta, Georgia 30303-2316
Telephone (404) 656-2840 Fax (404) 657-1040 <http://www.gashpo.org>

August 9, 2007

Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

RE: Robins Air Force Base: Renovate and Construct Marine Corps Units MAG-22, HMLA-773, and
MALS-42
Federal Agency: US Air Force
Houston County, Georgia
~~GA-070716-0009~~
609

Dear Ms. Jackson:

The Historic Preservation Division (HPD) has reviewed the information submitted regarding the above referenced project. Our comments are offered to assist the US Air Force (USAF) and its applicants in complying with the provisions of Section 106 and Section 110 of the National Historic Preservation Act, as amended.

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TEL:404 657 1040

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Jackson
GA-070716-009
August 9, 2007
Page 2

Sincerely,



Karen Anderson-Cordova
Unit Manager, Planning and Local Assistance Unit

KAC:jph

cc: Kristina Harpst, Middle Georgia RDC

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AUG 10 2007

GEORGIA
STATE CLEARINGHOUSE



OFFICE OF PLANNING AND BUDGET

Sonny Perdue
Governor

Trey Childress
Director

GEORGIA STATE CLEARINGHOUSE MEMORANDUM EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Sam Rocker
Environmental Management Div.
Dept. of the Air Force

FROM: Barbara Jackson *BT*
Georgia State Clearinghouse

DATE: 8/10/2007

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Final EA: Facility Renovation / New Construction and Operation of Marine Corps Units (MAG-42, HMLA-773 and MALS-42) Relocated from Naval Air Station Atlanta to Robins AFB

STATE ID: GA070716009

The applicant/sponsor is advised that DNR's Environmental Protection Division was included in this review but did not comment within the review period. Should they later submit comments, we will forward to you.

The applicant/sponsor is advised to note additional comments from DNR's Historic Preservation Division.

Provided that positive comments are forthcoming from DNR/EPD, the State level review of the above-referenced proposal will have been completed, and the proposal will have been found to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for Developments of Regional Impact (DRI), environmental impacts, federal executive orders, acts and/or rules and regulations with which the state is concerned.

/bj

Enc.: DOT, July 26, 2007
HPD, Aug. 10, 2007

Form NCC
January 2004

AN EQUAL OPPORTUNITY EMPLOYER

JUL-26-2007 THU 01:26 PM

FAX NO.

P. 01

**GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS**

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: GA DOT - AVIATION PROGRAMS
GEORGIA DOT

SUBJECT: Executive Order 12372 Review

APPLICANT: Dept. of the Air Force - Robins AFB, GA

PROJECT: Draft Final EA: Facility Renovation / New Construction and Operation of Marine Corps Units (MAG-42, HMLA-773 and MALS-42) Relocated from Naval Air Station Atlanta to Robins AFB

STATE ID: GA070716009

FEDERAL ID:

DATE:

- ☐ This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This notice is not consistent with:

- ☐ The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).
- ☐ The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).

- ☒ This notice does not impact upon the activities of the organization.

NOTE: Should you decide to FAX this form (and any attached pages), it is not necessary to mail the originals to us.

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STATE CLEARINGHOUSEForm SC-3
May 2007

Aug 10 07 05:19p

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p. 2

**GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS**

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: MARK SMITH *ES (for MS)*
DNR/EPD/HAZARDOUS WASTE MANAGEMENT BRANCH

SUBJECT: Executive Order 12372 Review

APPLICANT: Dept. of the Air Force - Robins AFB, GA

PROJECT: Draft Final EA: Facility Renovation / New Construction and Operation of Marine Corps Units (MAG-42, HMLA-773 and MALS-42) Relocated from Naval Air Station Atlanta to Robins AFB

STATE ID: GA070716009

FEDERAL ID:

DATE:

- ☒ This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

However, the attached comments should be addressed in the final document:

This notice is not consistent with:

- ☐ The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).
- ☐ The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies. Be sure to put the GA State ID number on all pages).
- ☐ This notice does not impact upon the activities of the organization.

NOTE: Should you decide to FAX this form (and any attached pages), it is not necessary to mail the originals to us.

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AUG 10 2007

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Form SC-3
May 2007

GA EPD Comments on Draft Final EA: Facility Renovation/New Construction and Operation of Marine Corps Units (MAG-42, HMLA0773 and MALS-42) Relocated from Naval Air Station Atlanta to Robins AFB, dated June 8, 2007, received July 16, 2007, State ID# GA070716009

The Hazardous Waste Management Branch of the Georgia Environmental Protection Division has completed review of the above document. From that review, we have the following comments:

Comment #1

Section 3.3.3 Hazardous Materials and Waste

This section states that hazardous waste generated by the facility is managed in accordance with the Resource Conservation and Recovery Act (RCRA) and the Georgia Rules for Hazardous Waste Management. Robins Air Force Base (Robins AFB) is also regulated by the facility's Hazardous Waste Facility Permit. Certain requirements are stipulated in that permit. Therefore, that permit should be referenced in this section of the EA.

Comment #2

Section 4.3.3.2 Hazardous Materials and Waste (Proposed Action)

This section references Robins AFB's "HWMP". The list of acronyms in the front of this EA does not include the acronym "HWMP". This may refer to the Hazardous Waste Management Permit; however, it is not clear. Please include this acronym in the acronym list. Since the proposed Marine Corps Units are situated within Robins AFB's property, as with all tenants on the base, all hazardous wastes generated on Robins AFB, including the hazardous wastes generated by the Marine Corps, should be shipped off-site under Robins AFB EPA ID#, and count towards Robins AFB's total monthly generation quantity. Please clarify in the document that all hazardous wastes generated by the Marine Corps will be managed and disposed of pursuant to the requirements of §262 of the Georgia Rules for Hazardous Waste Management, and in accordance with the Robins AFB Hazardous Waste Facility Permit.

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AUG 10 2007

**GEORGIA
STATE CLEARINGHOUSE**

APPENDIX C

CALCULATIONS

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Mobile Air Emission Calculations

Table 1 - Flight Operations

Aircraft Model	Number of Sorties (or LTO Cycles ¹) per Day	Number of Days Sorties are Flown per Week	Number of Weeks per Year Sorties are Flown ³	Total Number of Sorties Flown per Year ²
19th ARG (Existing)				
KC-135	3	5	52	780
Marine Corps (Proposed)				
AH-1 - Mon - Fri	3	5	52	693
UH-1 - Mon - Fri	5	5	52	1,387
AH-1 - Drill Weekends	4	2	12	96
UH-1 - Drill Weekends	8	2	12	192
AH-1 - Total				789
UH-1 - Total				1,579

¹LTO: Landing-Takeoff

² (Number of Sorties (or LTO Cycles) per Day) * (Number of Days Sorties are Flown per Week) * (Number of Weeks per Year Sorties are Flown) = Total

Number of Sorties Flown per Year

³Assuming worst case scenario: sorties flown 52 weeks per year.

All data in the following tables are from *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*. AF IERA, January 2002.

Table 2 - Flight Operations

Aircraft Model	Aircraft Model Used to Match to Available Emission Factors ¹	LTO Cycles (from Table 1)
19th ARG (Existing)		
KC-135	KC-135	780
Marine Corps (Proposed)		
AH-1	UH-1	789
UH-1	UH-1	1,579

¹ Source: *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*. AF IERA, January 2002.

Table 3 - Number of Engines

Aircraft Model	Number of Engines ¹
Existing	
KC-135 (19 th ARG)	4
Proposed	
AH-1 (Marine Corps)	1
UH-1 (Marine Corps)	1

¹ Source: *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*. AF IERA, January 2002.

Mobile Air Emission Calculations

Table 4 - Air Pollutant Emission Factors

Aircraft Model	Power Setting ¹	Fuel Flow (lb/hr) ¹	Emission Factors in Pounds (lb) Pollutant per 1,000 lb Fuel Burned ¹					
			PM10	PM2.5 ³	CO	NOx	SOx ⁴	VOCs
KC-135 (19 th ARG)	Idle	1,136	9.08	9.08	27.19	3.94	0.46	0.92
	Takeoff	6,458	1.59	1.59	0.63	15.28	0.46	0.03
	Climbout	5,650	0.65	0.65	1.61	13.53	0.46	0.03
	Approach	2,547	1.55	1.55	6.39	6.96	0.46	0.04
UH-1 ² (Marine Corps)	Idle	145	-	-	31.51	1.58	0.46	58.09
	Takeoff	690	-	-	3.85	7.75	0.46	0.27
	Climbout	645	-	-	6.83	6.43	0.46	0.57
	Approach	222	-	-	37.79	2.53	0.46	13.57

¹ Source: *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*. AF IERA, January 2002.

² Published emission factors for the AH-1 helicopter were not found. Emission factors for the UH-1 helicopter were used in these and the following calculations for AH-1 helicopter operations, as the UH-1 and AH-1 helicopters have similar engines.

³ PM2.5 emission factors are not available; PM2.5 is conservatively assumed equivalent to PM10 emissions.

⁴ SOx emission factor (S) assumes

%wt sulfur in JP-8 for east coast

U.S = (0.023 % weight).

0.023 % weight

⁴ Emission Factor for SOx = 20 * S

Table 5 - Time in Each Power Setting

Aircraft Model	Time (in minutes) ¹					
	Idle Out	Takeoff	Climbout	Approach	Idle In	Total
KC-135 (19 th ARG)	32.8	0.7	1.6	5.2	14.9	55.2
UH-1 (Marine Corps)	8	0	6.8	6.8	7	28.6

¹ Source: *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*. AF IERA, January 2002.

Table 6 - Emissions per LTO

Aircraft Model	Emissions ¹ (lb)					
	PM10	PM2.5	CO	NOx	SOx	VOCs
KC-135 (19 th ARG)	35.04	35.04	105.03	33.14	2.48	3.39
UH-1 (Marine Corps)	-	-	2.59	0.59	0.06	2.49

¹ Emissions (lb) = [(minutes) * (fuel flow/minutes) * (lbs pollutant/lb fuel)] for each power setting * (number of engines)

"minutes" - from Table 5

"fuel flow" - from Table 4

"lbs Pollutant/lb fuel" - from Table 4

"number of engines" - from Table 3

Mobile Air Emission Calculations

Table 7 - LTO Airfield Emissions (lb/year) by Aircraft Type

Aircraft Model	Emissions (lb/year) ¹					
	PM10	PM2.5	CO	NOx	SOx	VOCs
KC-135 (19 th ARG)	27,331.84	27,331.84	81,919.97	25,847.36	1,937.33	2,641.02
UH-1 (Marine Corps)	-	-	6,138.58	1,399.40	146.52	5,893.60

¹ Calculated Emissions (lb/year) = [(No. LTOs) * (lbs/LTO)]

"No. LTOs" - from Table 2

"lbs/LTO" - from Table 6

Table 8 - LTO Airfield Emissions (tons/year) by Aircraft Type

Aircraft Model	LTO Airfield Emissions (tons/year) ¹					
	PM10	PM2.5	CO	Nox	SOx	VOCs
KC-135 (19 th ARG) (EXISTING)	13.67	13.67	40.96	12.92	0.97	1.32
UH-1 (Marine Corps) (PROPOSED)	0.00	0.00	3.07	0.70	0.07	2.95
CHANGE IN EMISSIONS (Existing versus Proposed Action)	-13.67	-13.67	-37.89	-12.22	-0.90	1.63

¹ Calculated Emissions (tons/year) = [LTO Airfield Emissions (tons/year) / (2,000 lbs/1 ton)]

Total Reduction of Air Emissions from Aircraft = 76.72 tons/year

Percentage of Air Emissions Would Decrease 91.87%

Sanitary Wastewater Calculations

Table 1 - 19th ARG - Sanitary Wastewater Generation (EXISTING)

Days of the Week	Number of Personnel	Wastewater Generated per Person per Day (gallons) ¹	Average Number of Days per Month	Total Wastewater Generated per Month (gallons)
Mon - Fri	400	25	22	220,000

Table 2 - Marine Corps - Sanitary Wastewater Generation (PROPOSED ACTION)

Days of the Week	Number of Personnel	Wastewater Generated per Person per Day (gallons) ¹	Average Number of Days per Month	Total Wastewater Generated per Month (gallons)
Mon - Fri	300	25	22	165,000
Drill Weekends	600	25	2	30,000
Total				195,000

Percentage of Sanitary Wastewater Generated Would Decrease 11.36%

¹ "Wastewater Generated per Person per Day" data use data for "Workers including Factory, Office, School, Commercial and Construction (without showers and industrial waste)" in the Georgia Department of Human Resources, Division of Public Health 2006. *Manual for On-Site Sewage Management Systems*.

Trips Calculations

Table 1 - 19th ARG - POV Trips per Month to the Subject Project Area at Robins AFB

Days of the Week	Number of Personnel	Average Number of Roundtrips per Day	Average Number of Days per Month	Total Trips Generated per Month
Mon - Fri	400	1	22	8,800

Table 2 - Marine Corps - POV Trips per Month to the Subject Project Area at Robins AFB

Days of the Week	Number of Personnel	Average Number of Roundtrips per Day	Average Number of Days per Month	Total Wastewater Generated per Month (gallons)
M-F	300	1	22	6,600
Drill Weekends	600	1	2	1,200
Total				7,800

Percentage of POV Trips Would Decrease 11.36%

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APPENDIX D

**AIRCRAFT NOISE BACKGROUND INFORMATION AND NOISE MODELING
RESULTS**

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AIRCRAFT NOISE BACKGROUND INFORMATION AND NOISE MODELING RESULTS

1.0 INTRODUCTION TO AIRCRAFT NOISE

This section describes several aircraft noise terms that are used throughout this EA, several common effects of aircraft noise, and the FAA's methodology for evaluation of aircraft noise.

1.1 AIRCRAFT NOISE TERMINOLOGY

The Decibel, dB – All sounds come from a sound source: a musical instrument, a voice, an airplane. The energy produced by these sounds is transmitted through the air in sound waves, or sound pressures, which impinge on the ear, creating the sound we hear.

Logarithms are used to produce a ratio of two pressures; the first is the sound source and the second is the reference pressure or the quietest sound we can hear. This ratio is referred to as a Sound Pressure Level (SPL), expressed in decibels (dB). This logarithmic conversion means that the quietest sound we can hear has an SPL of 0 dB, while the loudest sounds we can hear have SPLs of about 120 dB. Most environmental sounds have SPLs ranging from 30 to 100 dB.

Because decibels are logarithmic, they do not behave like other numbers. For example, if two sound sources each produce 100 dB, when they are operated together they will produce 103 dB, not 200 dB. Four 100 dB sources operating together again double the sound energy, resulting in a total SPL of 106 dB, and so on. In addition, if one source is much louder than another, the two sources operating together will produce the same SPL as if the louder source was operating alone. For example, a 100 dB source plus an 80 dB source produce 100 dB when operating together. The louder source masks the quieter source.

Two useful rules of thumb to remember when comparing SPLs are: (1) most people perceive a 6 to 10 dB increase in SPL between two noise events to be about a doubling of loudness and (2) changes in SPL of less than about 3 dB between two events are not easily detected outside a laboratory.

A-Weighted Decibel, dBA / also known as A-Weighted Sound Level ALM – Frequency, or pitch, is an important characteristic of sound. When analyzing noise, it is of interest to know how much is low, middle or high frequency. This breakdown is important for two reasons. First, human ears are better equipped to hear middle and high frequencies; middle and high frequencies are more annoying. High-frequency noise also produces more hearing loss. Second, engineering solutions to noise problems are different for different frequency ranges. The normal frequency range of hearing for most people extends from about 20 to 15,000 Hertz (Hz). The "A" weighting filter approximates the sensitivity of the human ear and helps in assessing the perceived loudness of various sounds.

Maximum A-Weighted Noise Level, L_{\max} – A-weighted sound levels vary with time. For example, the sound increases as an aircraft approaches, then falls and blends into the background as the aircraft recedes into the distance. Because of this variation, it is often convenient to describe a particular noise “event” by its maximum sound level (L_{\max}). Note that L_{\max} describes only one dimension of a sound event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical L_{\max} may produce very different total exposures. One may be of a very short duration, while the other may be much longer and judged as much more annoying. Sound Exposure Level corrects for this deficiency.

Sound Exposure Level, SEL – The most common measure of cumulative noise exposure for a single aircraft flyover is the SEL. SEL is a summation of the A-weighted sound energy at a particular location over the duration of a noise event. The duration is defined as the amount of time the noise event exceeds background levels. Mathematically, the SEL equation compresses (totals) this noise energy into a column one second wide. The height of the column is the SEL, measured in decibels

Because the SEL is normalized to one second, it will almost always be higher in magnitude than the L_{\max} for the event. In fact, for most aircraft events, the SEL is about 7 to 12 dB higher than the L_{\max} . Also, the fact that it is a cumulative measure means that a higher SEL can result from either a louder or longer event, or some combination.

SEL provides a comprehensive way to describe noise events for use in modeling and comparing noise environments. Computer noise models base their computations on the SELs.

Day-Night Average Sound Level, DNL – The DNL represents noise as it occurs over a 24-hour time period. It is the same as a 24-hour equivalent sound level (L_{eq}), with one important exception: DNL treats nighttime noise differently from daytime noise. The equivalent sound level is the logarithm of the average value of the sound exposure during a stated time period. It is often used to describe sounds with respect to their potential for interfering with human activity. In calculating DNL, it is assumed that the A-weighted levels occurring at night (10:00 p.m. to 7:00 a.m.) are 10 dB louder than they really are. This penalty is applied to account for greater sensitivity to nighttime noise and because events at night are often perceived to be more intrusive.

Tone Corrective Perceived Noise Level, PNLT – The PNLT is a rating of the noisiness of an event, adjusted to account for the presence of discrete frequency components. PNLT was developed and has been used almost exclusively for the prediction of the perceived noisiness for aircraft activity. An increase of 10 dB is equivalent to a doubling of the perceived noisiness.

Effective Perceived Noise Level, EPNL – This is a single number measure of aircraft flyover noise which approximates human annoyance responses and includes a correction for the duration of the event.

1.2 ***EFFECTS OF AIRCRAFT NOISE ON PEOPLE***

This section addresses the primary ways humans can be affected by an airport (military operation, commercial operations, etc.): speech interference and sleep disturbance.

Speech Interference – A primary effect of aircraft noise is its tendency to drown out or “mask” speech, making it difficult to carry on a normal conversation. The sound level of speech decreases as the distance between the speaker and the listener increases. As an aircraft approaches and its sound level increases, it becomes harder to hear speech. As the background noise level increases, the speaker must raise his/her voice or the individuals must get closer together to continue talking.

For typical communication distances of three or four feet (1 to 1.5 meters), acceptable outdoor conversations can be carried on in a normal voice as long as the background noise outdoors is less than about 65 dBA. If the noise exceeds this level, intelligibility would be lost unless vocal effort increased or communication distance decreased.

Sleep Disturbance – Research on sleep disruption from noise has led to widely varying observations. In part, this is because: (1) sleep can be disturbed without causing awakening, (2) the deeper the sleep the more noise it takes to cause arousal, (3) the tendency to awaken increases with age, and (4) other factors. In addition, most of the early sleep disturbance studies have been conducted under laboratory conditions, which minimizes the effect habituation is believed to have on awakening. A field study of noise-induced sleep disturbance was conducted in residents’ homes near Los Angeles International Airport, Castle Air Force Base and control locations (non-aircraft influenced) in the Los Angeles Area. The study supports the theory that habituation has a great influence on noise-induced sleep disturbance. The major findings of the study, which can be applied to long-term residences of areas with stable nighttime noise exposure, are as follows:

- A statistically reliable relationship between SEL and sleep disturbance (within 5 minutes of the event) was observed. That is, the higher the SEL, the greater the likelihood that the residents sleep would be disturbed.
- Long-term noise exposure metrics, such as DNL, show no useful association with sleep disturbance.
- The average spontaneous (non-noise event related) awakening rate was approximately two per night, regardless of other noise sources (Fidell et al., August 1995).

Similar findings were found in a study of sleep disturbance near the Denver International Airport before and after its opening in 1995 (Fidell et al., December 1995). A study in England (Ollerhead et al., 1992) found that “very few people living near airports are at risk of any substantial sleep disturbance due to aircraft noise, even at the highest event noise levels.”

1.4 COMMUNITY RESPONSE TO AIRCRAFT NOISE

Social survey data make it clear that individual reactions to noise vary widely for a given noise level. Nevertheless, as a group, people's aggregate response is predictable and relates well to measures of cumulative noise exposure such as DNL

1.5 FAA METHODOLOGY FOR EVALUATION OF AIRCRAFT NOISE

The evaluation of the airport noise environment was conducted using the methodologies developed by the FAA and published in FAA Order 5050.4A, FAA Order 1050.1E and FAR Title 14 CFR Part 150. These publications require that aircraft noise levels in the vicinity of airports be determined on an annual average-daily basis utilizing the Day Night Average Sound Level (DNL) metric.

The Integrated Noise Model (INM), Version 6.2a, was used to produce the noise contours for the Air Installation Compatible Use Zone (AICUZ) study and to analyze noise levels at sensitive sites. The FAA developed the INM computer model and it is the most commonly used method to predict airport noise contours. FAA continually enhances the INM to take advantage of increased computer speed, to incorporate new aircraft types into the aircraft noise database and to improve its noise computation algorithms.

INM was designed to model the noise from aircraft operations in the immediate vicinity of an airport. Numerous tests have proven its ability to accurately model the DNL metric at distances from the airport corresponding to the 65 dB DNL contour. The INM models departure operations beginning at the start of takeoff roll and ending when aircraft reach an altitude of 10,000 feet. Standard modeling of arrival operations begins when the aircraft is at an altitude of 6,000 feet and ends when the aircraft land and completes the application of reverse thrust.

Information required to run the model includes:

- A physical description of the airport layout, including location, length and orientation of all runways,
 - The airport elevation and average annual temperature,
 - The aircraft fleet mix for the average day,
 - The number of daytime flight and engine run-up operations (7 a.m. to 9:59 p.m.),
 - The number of nighttime flight and engine run-up operations (10 p.m. to 6:59 a.m.),
 - Runway utilization rates,
 - Primary departure, arrival and closed pattern (touch-and-go) flight tracks,
-

Health Effects – Regarding public health effects, the “Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety” stated, “At this time there is insufficient scientific evidence that non-auditory diseases are caused by noise levels lower than those that cause noise induced hearing loss.” That document identified a Leq not exceeding 70 dB (i.e. 8 hours per day) over a forty-year period for protection against noise-induced hearing loss (U.S. EPA, 1974). In 1981, the National Academy of Sciences, Committee on Hearing, Bioacoustics and Biomechanics (CHABA) was asked by the National Institute for Occupational Safety and Health (NIOSH) to consider research that might be performed to examine the effects on human health from long-term exposure to noise. The CHABA (working Group 18), in their report, *The Effects on Human Health from Long-Term Exposure to Noise*, concluded that “evidence from available research is suggestive, but it does not provide definitive answers to the question of health effects other than to the auditory system of the long-term exposure to noise” (National Academy of Sciences, 1981). Consequently, the issue of whether significant non-auditory health effects result from aircraft noise still remains and requires additional research.

1.3 VIBRATION RESULTING FROM AIRCRAFT OPERATIONS

Generally, fixed-wing subsonic aircraft do not generate vibration levels of the frequency or intensity to result in damage to structures. It has been found that exposure to normal weather conditions, such as thunder and wind, usually have more potential to result in significant structural vibration than aircraft (FAA, 1985). Two studies involving the measurement of vibration levels resulting from aircraft operations upon sensitive historic structures concluded that aircraft operations did not result in significant structural vibration.

For an Environmental Impact Statement (EIS) conducted at the Stinson Municipal Airport in San Antonio, Texas, vibration measurements were taken at several historic structures in the airport vicinity. At sites located between 1.1 and 2.5 miles from the airport, vibration of historic structures caused by aircraft operations were found to fall far below the most stringent structural damage criteria (Raba-Kistner Consultants, 1986).

At the Pueblo Grande Museum Culture Park located in Phoenix, Arizona, a vibration measurement analysis was accomplished to identify the source of vibration which appeared to result in structural damage to ancient Hohokam Indian ruins located in the park. These ruins, constructed of adobe, are listed in the National Register of Historic Places and the area is designated as a National Historic Landmark. Pueblo Grande is located in the vicinity of busy roadways, a railroad and within 0.5 mile of the longest runway of the Phoenix Sky Harbor International Airport (PHX). The airport is one of the busiest in the U.S. and serves hundreds of large jet aircraft operations daily, including one of the largest aircraft in the world, the Boeing 747. The results of the vibration analysis indicated that activities at PHX create low or no risk of damage to the adobe ruins from vibration (King et al., 1991).

Given the conclusions reached in the studies above, significant vibration that has the potential to cause structural damage is not likely to result from the operation of an airport.

- Flight track utilization rates,
- Aircraft flight profiles, including speed, engine power setting and altitude, versus distance along a flight track, for each aircraft type, and
- Terrain elevation within the study area.

1.6 OMEGA 10 NOISE EVALUATION PERFORMED IN SUPPORT OF THIS EA

The outputs of the Omega 10 noise evaluation conducted in support of the subject EA are presented in the following tables. The results are summarized in Section 4.4.2 of the EA.

Omega 10 Output

FLIGHT AIRCRAFT ID: FM60401
 FLIGHT AIRCRAFT NAME: **UH-1N**
 ENGINE NAME: PT6T-3B Twin Pac
 NUMBER OF ENGINES: 2
 MEASURED FLIGHT NOISE DATA UPDATED: 07 APR 1980
 SOURCE OF FLIGHT NOISE DATA: U.S.A.F.
 NUMBER OF POWER SETTINGS REQUESTED: 1

PROFILE ID INTERPOLATION TYPE POWER SETTING SPEED (KNOTS) POWER DESCRIPTION
 FM6040101 FIXED 100.00 % RPM 80 FLT AT 80 KTS

Distance (ft)	SEL (dB)		EPNL (EPNdB)		ALM (dBA)		PNLT (PNdB)	
	A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
200	101.8	101.8	106.8	107	91	91	105.5	105.8
250	100.4	100.4	105.2	105.5	89	89	103.4	103.6
315	98.9	96.2	103.7	102.2	86.9	84.2	101.2	99.7
400	97.4	92.3	102.1	98.3	84.8	79.7	99	95.2
500	96	89.5	100.5	95.3	82.8	76.3	96.8	91.7
630	94.5	86.8	98.8	92.5	80.7	73	94.6	88.3
800	92.9	84.1	97.1	89.6	78.5	69.7	92.3	84.7
1000	91.4	81.7	95.4	86.6	76.4	66.7	89.9	81.1
1250	89.8	79.3	93.6	83.8	74.2	63.7	87.6	77.7
1600	88.2	77.2	91.8	80.9	72	61	85.1	74.3
2000	86.6	75.2	89.9	78.7	69.8	58.4	82.6	71.4
2500	84.9	73.2	87.9	76.3	67.5	55.8	80	68.4
3150	83.1	71.3	85.7	73.9	65.1	53.3	77.3	65.4
4000	81.3	69.4	83.3	70.9	62.7	50.8	74.4	62
5000	79.4	67.3	80.8	67.8	60.2	48.1	71.3	58.3
6300	77.4	65.1	78.2	64.9	57.6	45.3	68.2	54.9
8000	75.3	62.8	75.4	61.8	54.9	42.4	64.9	51.3
10000	73.1	60.4	72.4	58.3	52.1	39.4	61.5	47.4
12500	70.7	57.3	69.5	53.7	49.1	35.7	57.9	42.1
16000	68.1	54.2	66.2	48.5	45.9	32	54	36.3
20000	65.3	51	62.6	42.2	42.5	28.2	49.9	29.5
25000	62.1	47.8	58.4	31.4	38.7	24.4	45	18

Omega 10 Output

FLIGHT AIRCRAFT ID: FM61101
 FLIGHT AIRCRAFT NAME: AH-1G
 ENGINE NAME: T53-L-13
 NUMBER OF ENGINES: 1

MEASURED FLIGHT NOISE DATA UPDATED: 14 DEC 1992
 SOURCE OF FLIGHT NOISE DATA: USA/CERL
 NUMBER OF POWER SETTINGS REQUESTED: 2

PROFILE ID INTERPOLATION TYPE POWER SETTING SPEED (KNOTS) POWER DESCRIPTION
 FM6110164 FIXED 100.00 KNOTS 100 LFO LITE 100 KTS

Distance (ft)	SEL (dB)		EPNL (EPNdB)		ALM (dBA)		PNLT (PNdB)	
	A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
200	70.2	70.2	75.5	75.5	60.2	60.2	72.3	72.3
250	67	67	68.6	68.6	56.4	56.4	64.8	64.8
315	64.5	64.2	60.6	59.4	53.3	53	56.2	55
400	62.6	61.6	51	49.2	50.8	49.8	46.1	44.2
500	61	60.2	36.7	35.3	48.6	47.9	31.2	29.7
630	59.5	59	17.6	14.6	46.5	46.1	11.4	8.5
800	58.1	58	-1.6	-6	44.5	44.4	-8.4	-12.8
1000	56.7	56.9	-20.7	-26.6	42.5	42.8	-28.1	-34
1250	55.3	55.9	-39.9	-47.3	40.5	41.2	-47.9	-55.2
1600	53.9	55	-59.1	-67.9	38.5	39.7	-67.6	-76.5
2000	52.5	54.1	-78.2	-88.6	36.5	38.1	-87.4	-97.7
2500	51.1	53.1	-97.4	-109.2	34.5	36.5	-107.1	-119
3150	49.7	51.9	-116.5	-129.8	32.5	34.7	-126.9	-140.2
4000	48.3	50.4	-136.4	-151.1	30.5	32.6	-146.7	-161.4
5000	46.9	48.5	-156.2	-172.4	28.5	30.2	-166.4	-182.7
6300	45.5	46.8	-176	-193.7	26.5	27.8	-186.2	-203.9
8000	44.1	45.4	-195.8	-215	24.5	25.8	-205.9	-225.1
10000	42.7	44	-215.6	-236.3	22.5	23.8	-225.7	-246.4
12500	41.3	42.6	-234.8	-256.9	20.5	21.8	-245.5	-267.6
16000	39.9	41.2	-253.9	-277.6	18.5	19.8	-265.2	-288.8
20000	38.5	39.8	-273.1	-298.2	16.5	17.8	-285	-310.1
25000	37.1	38.4	-292.3	-318.9	14.5	15.8	-304.7	-331.3

Omega 10 Output

FLIGHT AIRCRAFT ID: FM61101
 FLIGHT AIRCRAFT NAME: AH-1G
 ENGINE NAME: T53-L-13
 NUMBER OF ENGINES: 1

MEASURED FLIGHT NOISE DATA UPDATED: 14 DEC 1992
 SOURCE OF FLIGHT NOISE DATA: USA/CERL
 NUMBER OF POWER SETTINGS REQUESTED: 2

PROFILE ID INTERPOLATION TYPE POWER SETTING SPEED (KNOTS) POWER DESCRIPTION
 FM6110177 FIXED 40.00 KNOTS 40 LND LITE 40 KTS

Distance (ft)	SEL (dB)		EPNL (EPNdB)		ALM (dBA)		PNLT (PNdB)	
	A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
200	72.4	72.4	75	75	65.5	65.5	78.1	78.1
250	68.4	68.4	68.3	68.3	60.9	60.9	70.7	70.7
315	65.6	65.3	60.6	60.1	57.5	57.2	62.5	61.9
400	63.7	62.7	51.7	50.1	54.9	54	52.9	51.4
500	62.1	61.4	40.9	39.2	52.7	52	41.6	39.9
630	60.6	60.2	24.8	23.9	50.7	50.2	24.9	23.9
800	59.2	59.1	8.7	8.5	48.7	48.5	8.2	8
1000	57.8	58.1	-7.4	-6.8	46.7	46.9	-8.6	-8
1250	56.4	57.1	-23.5	-22.2	44.7	45.3	-25.3	-23.9
1600	55	56.2	-39.7	-37.5	42.7	43.8	-42	-39.9
2000	53.6	55.2	-55.8	-52.9	40.7	42.3	-58.7	-55.8
2500	52.2	54.2	-71.9	-68.2	38.7	40.7	-75.4	-71.8
3150	50.8	53	-88	-83.6	36.7	38.9	-92.1	-87.7
4000	49.4	51.5	-104.1	-98.9	34.7	36.8	-108.8	-103.7
5000	48	49.7	-120.2	-114.3	32.7	34.3	-125.5	-119.6
6300	46.6	47.9	-136.3	-129.6	30.7	31.9	-142.3	-135.6
8000	45.2	46.5	-152.4	-144.9	28.7	29.9	-159	-151.5
10000	43.8	45.1	-168.5	-160.3	26.7	27.9	-175.7	-167.5
12500	42.4	43.7	-184.6	-175.6	24.7	25.9	-192.4	-183.4
16000	41	42.3	-200.7	-191	22.7	23.9	-209.1	-199.4
20000	39.6	40.9	-216.8	-206.3	20.7	21.9	-225.8	-215.3
25000	38.2	39.5	-233	-221.7	18.7	19.9	-242.5	-231.3

Omega 10 Output

FLIGHT AIRCRAFT ID: FM03104
 FLIGHT AIRCRAFT NAME: KC-135R
 ENGINE NAME: F108-CF-100
 NUMBER OF ENGINES: 4

MEASURED FLIGHT NOISE DATA UPDATED: 14 JUL 1988
 SOURCE OF FLIGHT NOISE DATA: U.S.A.F.
 NUMBER OF POWER SETTINGS REQUESTED: 4

PROFILE ID INTERPOLATION TYPE POWER SETTING SPEED (KNOTS) POWER DESCRIPTION
 FM0310405 PARALLEL 66.50 % NF 160 APPROACH POWER

Distance (ft)	SEL (dB)		EPNL (EPNdB)		ALM (dBA)		PNLT (PNdB)	
	A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
200	102	102	106.4	105.8	99.1	99.1	112.7	112.2
250	100.5	100.5	104.7	104.2	97	97	110.5	109.9
315	98.9	97.7	103	101.6	94.8	93.6	108.2	106.7
400	97.3	94.9	101.3	98.7	92.6	90.2	105.8	103.2
500	95.7	92.5	99.4	96.2	90.4	87.2	103.4	100.1
630	94	90.1	97.5	93.5	88.1	84.2	100.8	96.9
800	92.3	87.7	95.4	90.8	85.8	81.2	98.2	93.6
1000	90.5	85.4	93.2	88	83.4	78.3	95.4	90.2
1250	88.7	83	90.8	85	81	75.3	92.4	86.6
1600	86.7	80.9	88.4	82.3	78.4	72.6	89.3	83.2
2000	84.7	78.8	85.9	79.5	75.8	69.9	86.3	79.9
2500	82.6	76.7	83.6	76.6	73.1	67.2	83.4	76.4
3150	80.4	74.7	81.2	74	70.3	64.6	80.3	73.2
4000	78.1	72.6	78.4	71.2	67.4	61.9	77.1	69.9
5000	75.7	70.3	75.6	68.1	64.4	59	73.7	66.3
6300	73.1	67.9	72.5	65.1	61.2	56	70.2	62.8
8000	70.3	65	69.4	61.8	57.8	52.5	66.6	59
10000	67.3	61.8	65.9	58.1	54.2	48.7	62.6	54.8
12500	64.1	57.6	62.4	53.5	50.4	43.9	58.6	49.6
16000	60.6	52.8	58.7	47.1	46.3	38.5	54.2	42.6
20000	57	47.5	54.6	39.3	42.1	32.6	49.5	34.2
25000	53.1	41.9	49.6	30.3	37.6	26.4	44	24.6

Omega 10 Output

FLIGHT AIRCRAFT ID: FM03104
FLIGHT AIRCRAFT NAME: KC-135R
ENGINE NAME: F108-CF-100
NUMBER OF ENGINES: 4

MEASURED FLIGHT NOISE DATA UPDATED: 14 JUL 1988
SOURCE OF FLIGHT NOISE DATA: U.S.A.F.
NUMBER OF POWER SETTINGS REQUESTED: 4

PROFILE ID INTERPOLATION TYPE POWER SETTING SPEED (KNOTS) POWER DESCRIPTION
FM0310406 VARIABLE 80.30 % NF 160 INTERMEDIATE POWER

Distance (ft)	SEL (dB)		EPNL (EPNdB)		ALM (dBA)		PNLT (PNdB)	
	A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
200	103.9	103.9	108.5	108.6	101	101	114.7	114.8
250	102.4	102.4	106.8	106.9	98.9	98.9	112.4	112.5
315	100.8	99.1	105.1	104.2	96.7	95	110.1	109.2
400	99.2	96.1	103.3	101.2	94.5	91.4	107.7	105.5
500	97.5	93.5	101.4	98.6	92.3	88.3	105.2	102.4
630	95.9	91.1	99.4	95.9	90	85.2	102.5	99
800	94.1	88.7	97.2	93.1	87.6	82.2	99.8	95.7
1000	92.4	86.3	95.2	90.2	85.3	79.2	97.1	92.2
1250	90.5	84	93.1	87.1	82.8	76.3	94.4	88.5
1600	88.7	81.9	90.8	84.2	80.4	73.6	91.6	85
2000	86.7	79.7	88.6	81.3	77.8	70.9	88.7	81.5
2500	84.7	77.7	86.1	78.5	75.2	68.2	85.7	78
3150	82.5	75.7	83.6	75.9	72.4	65.6	82.6	74.8
4000	80.2	73.6	80.7	73.2	69.6	62.9	79.2	71.6
5000	77.8	71.3	77.7	70.3	66.5	60.1	75.6	68.2
6300	75.2	69	74.7	67.3	63.3	57.1	72.1	64.8
8000	72.4	66.3	71.5	64.2	59.9	53.8	68.4	61.1
10000	69.4	63.2	68.1	60.6	56.3	50.1	64.5	57
12500	66.1	59.2	64.6	55.8	52.4	45.5	60.4	51.6
16000	62.4	54.6	60.8	49.9	48.2	40.3	56	45.1
20000	58.5	49.4	56.6	42.5	43.6	34.5	51.2	37.1
25000	54.3	43.7	51.7	34.5	38.8	28.2	45.7	28.5

Omega 10 Output

FLIGHT AIRCRAFT ID: FM03104
 FLIGHT AIRCRAFT NAME: **KC-135R**
 ENGINE NAME: F108-CF-100
 NUMBER OF ENGINES: 4

MEASURED FLIGHT NOISE DATA UPDATED: 14 JUL 1988
 SOURCE OF FLIGHT NOISE DATA: U.S.A.F.
 NUMBER OF POWER SETTINGS REQUESTED: 4

PROFILE ID INTERPOLATION TYPE POWER SETTING SPEED (KNOTS) POWER DESCRIPTION
 FM0310411 VARIABLE 89.60 % NF 160 MAX RATED THRUST

Distance (ft)	SEL (dB)		EPNL (EPNdB)		ALM (dBA)		PNLT (PNdB)	
	A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
200	106.2	106.2	110.3	110.3	102.5	102.5	115.7	115.7
250	104.6	104.6	108.7	108.7	100.4	100.4	113.5	113.5
315	103.1	101.1	107	105.8	98.3	96.3	111.2	110
400	101.5	98	105.2	103	96.1	92.6	108.8	106.6
500	100	95.5	103.4	100.5	93.9	89.5	106.4	103.4
630	98.3	93.1	101.4	97.8	91.7	86.5	103.8	100.2
800	96.6	90.7	99.4	95	89.4	83.5	101.2	96.8
1000	94.9	88.4	97.5	92.2	87.1	80.6	98.7	93.3
1250	93.2	86.1	95.5	89.1	84.7	77.7	96.1	89.7
1600	91.3	84	93.5	86.5	82.3	75	93.5	86.5
2000	89.4	81.9	91.3	83.7	79.8	72.3	90.7	83.1
2500	87.5	79.9	89.1	81	77.3	69.7	87.9	79.8
3150	85.4	77.9	86.7	78.3	74.6	67.1	84.9	76.5
4000	83.2	75.9	84.1	75.6	71.8	64.5	81.8	73.2
5000	80.9	73.7	81.4	72.8	68.9	61.7	78.5	69.9
6300	78.4	71.4	78.5	70	65.8	58.8	75.1	66.6
8000	75.8	68.8	75.5	67	62.6	55.6	71.5	63.1
10000	72.9	65.9	72.2	63.6	59.1	52.1	67.8	59.2
12500	69.8	62.1	68.9	59.1	55.4	47.6	63.8	54.1
16000	66.4	57.7	65.3	54	51.3	42.6	59.6	48.4
20000	62.6	52.8	61.2	47.5	47	37.1	55	41.2
25000	58.5	47.4	56.7	40	42.3	31.2	49.9	33.1

Omega 10 Output

FLIGHT AIRCRAFT ID: FM03104
 FLIGHT AIRCRAFT NAME: KC-135R
 ENGINE NAME: F108-CF-100
 NUMBER OF ENGINES: 4
 MEASURED FLIGHT NOISE DATA UPDATED: 14 JUL 1988
 SOURCE OF FLIGHT NOISE DATA: U.S.A.F.
 NUMBER OF POWER SETTINGS REQUESTED: 4

PROFILE ID INTERPOLATION TYPE POWER SETTING SPEED (KNOTS) POWER DESCRIPTION
 FM0310413 VARIABLE 70.50 % NF 160 TRAFFIC PATTERN

Distance (ft)	SEL (dB)		EPNL (EPNdB)		ALM (dBA)		PNLT (PNdB)	
	A-G	G-G	A-G	G-G	A-G	G-G	A-G	G-G
200	100.9	100.9	105.2	105.5	98.9	98.9	112	112.2
250	99.4	99.4	103.6	103.8	96.8	96.8	109.7	110
315	97.8	96.2	101.8	101	94.6	93	107.4	106.6
400	96.2	93.1	100	98.2	92.4	89.3	105	103.2
500	94.6	90.6	98.1	95.6	90.2	86.2	102.5	100
630	92.9	88.1	96.1	92.9	88	83.2	99.9	96.6
800	91.2	85.8	94	90	85.7	80.2	97.2	93.2
1000	89.5	83.5	92	87.1	83.3	77.3	94.5	89.6
1250	87.7	81.3	89.9	83.9	80.9	74.5	91.9	85.9
1600	85.8	79.2	87.8	81.2	78.4	71.8	89.1	82.5
2000	83.8	77.1	85.6	78.3	75.8	69.1	86.3	79.1
2500	81.8	75	83.2	75.6	73.2	66.4	83.4	75.7
3150	79.6	73	80.8	73.1	70.4	63.8	80.3	72.6
4000	77.3	70.9	78	70.3	67.5	61.1	77	69.3
5000	74.8	68.5	75.1	67.1	64.4	58.1	73.6	65.6
6300	72.2	65.9	72	63.9	61.2	55	70	61.9
8000	69.4	63	68.8	60.5	57.8	51.5	66.3	58
10000	66.4	59.7	65.1	56.6	54.2	47.6	62.1	53.5
12500	63.1	55.5	61.5	51.8	50.3	42.7	57.9	48.1
16000	59.6	50.6	57.8	45.2	46.2	37.3	53.6	41
20000	55.8	45.3	53.3	37	41.9	31.3	48.5	32.2
25000	51.8	39.6	48.1	28.2	37.2	25	42.7	22.8

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